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ENVIRONMENTAL ASSESSMENT BOARD

VOLUME: 286

DATE: Monday, February 4, 1991

BEFORE:

A. KOVEN Chairman

E. MARTEL Member

FOR HEARING UPDATES CALL (COLLECT CALLS ACCEPTED) (416)963-1249

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REPORTING INC.

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HEARING ON THE PROPOSAL BY THE MINISTRY OF NATURAL
RESOURCES FOR A CLASS ENVIRONMENTAL ASSESSMENT FOR
TIMBER MANAGEMENT ON CROWN LANDS IN ONTARIO

IN THE MATTER of the Environmental
Assessment Act, R.S.O. 1980, c.140;

- and -

IN THE MATTER of the Class Environmental
Assessment for Timber Management on Crown
Lands in Ontario;

- and -

IN THE MATTER of a Notice by the Honourable
Jim Bradley, Minister of the Environment,
requiring the Environmental Assessment
Board to hold a hearing with respect to a
Class Environmental Assessment (No.
NR-AA-30) of an undertaking by the Ministry
of Natural Resources for the activity of
Timber Management on Crown Lands in
Ontario.

Hearing held at the offices of the Ontario
Highway Transport Board, Britannica Building,
151 Bloor Street West, 10th Floor, Toronto,
Ontario, on Monday, February 4th, 1991,
commencing at 10:30 a.m.

VOLUME 286

BEFORE:

MRS. ANNE KOVEN
MR. ELIE MARTEL

Chairman
Member

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I N D E X O F P R O C E E D I N G S

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1 ---Upon commencing at 10:30 a.m.

2 MADAM CHAIR: Good morning. Please be
3 seated.

4 Good morning, Ms. Swenarchuk.

5 MS. SWENARCHUK: Madam Chair, Mr. Martel.

6 MADAM CHAIR: Oh, Ms. Swenarchuk, before
7 we begin, can I enter something as an exhibit. It's a
8 letter from a Mr. Matthew Vooro who sent it to the
9 Minister of the Environment and she sent it on to us to
10 be entered as part of our hearing.

11 And this is a one-page letter with a
12 one-page attachment with some statistical information
13 on it and Mr. Vooro, that's V-o-o-r-o, has dated his
14 letter December 30th, 1990, and we will give that
15 Exhibit No. 1689.

16 ---EXHIBIT NO. 1689: Letter dated December 30, 1990
17 from M. Vooro to Minister of
 Environment.

18 MS. SWENARCHUK: Madam Chair, I've
19 distributed a package of documents to each of the other
20 parties. As usual I would like to begin by marking
21 various exhibits.

22 MADAM CHAIR: Thank you, Ms. Swenarchuk,
23 for a typed list.

24 MS. SWENARCHUK: Beginning with the
25 witness statement.

MR. COSMAN: Excuse me, Madam Chair.

Maybe, I don't know if the mike is on, but even from here I'm having difficulties.

MS. SWENARCHUK: It's not an excellent system. Fortunately, Mr. Cosman, I won't be doing much talking today, so I don't think you'll have any trouble hearing the witnesses.

MR. COSMAN: That's good.

MS. SWENARCHUK: Thank you, but I agree.

So I believe the first document then would be Forest for Tomorrow's witness statement No. 7, and I take it that's 1691; is it?

MADAM CHAIR: 1690.

MS. SWENARCHUK: Exhibit 1690.

---EXHIBIT NO. 1690: Witness statement re: FFT Panel No. 7.

MS. SWENARCHUK: And next will be the two volumes of the source book for No. 7 which I suggest be numbered 1691A and B.

---EXHIBIT NO. 1691A: FFT Panel No. 7 Source Book I

---EXHIBIT NO. 1691B: FFT Panel No. 7 Source Book II

MS. SWENARCHUK: And next is the page in the bundle that I distributed this morning of errata and explanatory notes.

MADAM CHAIR: That will be Exhibit 1692

---EXHIBIT NO. 1692: One-page errata sheet with explanatory notes re: FFT Panel No. 7.

MS. SWENARCHUK: And I would just bring to your attention, Madam Chair, that counsel for the Ministry of Natural Resources had some concerns about the opinions expressed with regard to the adequacy of the Class EA Document and we have had some discussions privately and I wanted to clarify through the explanatory notes that the opinions being expressed by the witnesses are opinions based on their knowledge as economists and they're not to be considered legal opinions.

And next we'll mark the curriculum vitae
for Dr. Muller, I believe that will be 1693,
and then for Dr. Morrison, 1694.

---EXHIBIT NO. 1693: Curriculum vitae of Dr. Robert Muller re: FFT Panel No. 7.

---EXHIBIT NO. 1694: Curriculum vitae of Dr. Peter Morrison re: FFT Panel No. 7.

MS. SWENARCHUK: And then we have copies of overheads for Dr. Muller. And we now have three packages to be used by Dr. Muller - they're the next three packages on the file - the first one entitled: Panel 7 Outline of Evidence, and I suggest we make that 1695A; the next one, Introductory Comments, 1695B; and then the remaining package entitled: Problem, Choose

1 Harvest and Silvicultural System for a Hypothetical
2 Forest Management Unit, we could make that 1695C.

3 ---EXHIBIT NO. 1695A: Hard copies of overheads to be
4 used by Dr. Muller during oral
5 evidence entitled: Panel 7
6 Outline of Evidence.

7 ---EXHIBIT NO. 1695B: Hard copies of overheads to be
8 used by Dr. Muller during oral
9 evidence entitled: Introductory
10 Comments.

11 ---EXHIBIT NO. 1695C: Hard copies of overheads to be
12 used by Dr. Muller during oral
13 evidence entitled: Problem,
14 Choose Harvest and Silvicultural
15 System for a Hypothetical Forest
16 Management Unit.

17 MS. SWENARCHUK: The overheads for Dr.
18 Morrison are still being copied and are not available
19 to distribute yet, but we could perhaps give them the
20 number anyway of 1696.

21 ---EXHIBIT NO. 1696: Hard copies of overheads to be
22 used by Dr. Morrison during oral
23 evidence.

24 MR. COSMAN: What is that?

25 MS. SWENARCHUK: It would be copies of
26 overheads to be used by Dr. Morrison.

27 And lastly, the excerpt from the report
28 entitled: Timber Values, Stumpage and the 15 per cent
29 Export Tax, I would ask that we number that Exhibit
30 1697.

---EXHIBIT NO. 1697: Excerpt from report entitled:
Timber Values, Stumpage and the
15 per cent Export Tax.

MS. SWENARCHUK: And the complete report is here and if parties wish to refer to it.

And now I'd ask you to affirm the
witnesses please, Madam Chair.

MADAM CHAIR: Thank you.

MS. SWENARCHUK: I might just indicate beforehand that I believe you have all the interrogatories available and that Dr. Muller will probably refer this morning to MNR No. 14 and Canadian Association of Single Industry Towns No. 11. That will come later in the morning.

MADAM CHAIR: All right, thank you.

MS. SWENARCHUK: And now I would ask that you affirm the witnesses.

DR. ROBERT MULLER,
DR. PETER MORRISON, Affirmed

MADAM CHAIR: Thank you very much, gentlemen.

MS. SWENARCHUK: And I will now move to qualifying the witnesses.

DIRECT EXAMINATION BY MS. SWENARCHUK:

Q. Dr. Muller first, and I will indicate in advance that I will be asking that he be qualified

1 as a professional economist and as an expert in the
2 application of economic analysis to matters of public
3 policy including resource management.

4 Now, looking at your curriculum vitae,
5 Dr. Muller, and I understand that you are presently an
6 Associate Professor of Economics at McMaster University
7 and have held that position since 1979?

8 DR. MULLER: A. That's correct.

9 Q. And prefer to that, from 1972 to
10 1979, you were an Assistant Professor of Economics at
11 McMaster.

12 A. That's true.

13 Q. And I would just like to refer to
14 certain elements of your CV which are relevant to the
15 qualification we're seeking for your expertise today
16 are.

17 I understand that one of the subjects
18 that you studied in graduate school was public finance?

19 A. That's correct. I wrote
20 comprehensive examinations in the field of public
21 finance which includes theories of evaluating public
22 expenditures and public programs.

23 Q. And then your doctoral dissertation
24 was entitled: Simulation of Adjustment to the Costs of
25 Pollution Control in the Pulp and Paper Industry, and I

1 wonder if you could explain briefly for the Board what
2 that study entailed?

3 A. Well, very briefly, that study
4 entailed examining the pulp and paper industry,
5 building an econometric model, which is simply a
6 mathematical description of the industry, and
7 attempting to predict how much employment and output in
8 the industry would change if costs were to increase due
9 to increased requirements for pollution control.

10 Q. And then if we could look at page 3
11 of your CV which has to do with peer review journal
12 articles, I would like to just focus briefly on those
13 particularly relevant to this proceedings.

14 The first one, the first article listed
15 is, I understand, a publication based on your doctoral
16 thesis; is that correct?

17 A. Yes, in fact both of the first two
18 publications stem from my thesis.

19 Q. And then the third had to do with the
20 Canadian softwood lumber industry. Can you indicate
21 briefly what that entailed?

22 A. Yes. I wrote that article as a brief
23 comment on other econometric work which had been done,
24 in this particular case, on the Canadian softwood
25 industry.

1 Q. And then the fifth article had to do
2 with regional impacts of energy price increases on
3 Canadian pulp and paper mills. And how is that
4 relevant to this proceeding?

10 Q. Now, I understand that a theme of
11 your work - and I'll come to other articles in a
12 moment - has been that it is a useful approach to
13 environmental questions to study whether the benefits
14 of particular projects exceed the costs before the
15 environmental costs are considered?

18 Q. Can we look then at the article
19 entitled: The Role of Northern Hydro-electric Projects
20 in an Optimum Expansion Program for Ontario Hydro. In
21 what geographic area does that study focus?

25 Q. And could you expand slightly on what

1 it entailed?

2 A. Well, basically I was an attempt to
3 use a particular set of techniques called linear
4 programming techniques to estimate what we have called
5 in our witness statement the net social benefit to be
6 derived from building hydro-electric dams, possibly
7 building hydro-electric dams on the Moose River and
8 upstream rivers, and also examining the question of
9 whether the net social benefit that came out of that
10 project would be sufficient to compensate the local
11 residents for the damages that such a project might
12 inflict upon them.

13 Q. And the next paper had to do with the
14 value of water in Canada, and I understand that that
15 was done in connection with the Pearce Enquiry on Water
16 Policy?

17 A. That's true. This was a paper which
18 tried to address the commonly posed question: How much
19 is water worth to Canadians. And I used the techniques
20 of cost/benefit analysis to try to come to grips with
21 how you would talk about the value of water to
22 Canadians.

23 Q. And I understand that the next
24 article: Some Economics of the Grand Canal, also
25 studied that project which I'll ask you to explain

1 briefly in a moment using a cost/benefit analysis
2 approach?

3 A. That's true. The Grand Canal project
4 was or is a proposal to divert water from the northern
5 rivers, the Moosonee and others, the Moose River and
6 others and deliver it to the Great Lakes via one or
7 more diversion canals.

8 The proposal has seen several cycles of
9 attention, but my interest in this was whether or not
10 the project might be justified on financial grounds,
11 easily measurable grounds even before you worried about
12 environmental costs.

13 And my conclusion in that article was
14 that it was so clear that the project was not justified
15 on basic financial grounds that one need not worry too
16 much about the precise environmental costs, one should
17 not undertake that project in any case.

18 Q. And the next article you've cited is
19 on the Use and Misuse of Input/Output Base Impact
20 Analysis and Evaluation, and I understand that this
21 also has a public policy analysis orientation?

22 A. Well, that's certainly true. One of
23 the, as this Board knows, one of the most commonly
24 addressed questions in evaluating any public policy is
25 what is its impact on jobs, and very frequently

1 input/output tables are used to develop some kind of
2 estimates of what is the effect of a project on jobs.

3 And in this article my co-author and I
4 went through a number of reasons why one must be very
5 cautious about applying these multiplier estimates.

6 Q. And then you have cited a number of
7 publications related to housing questions, and I
8 understand that this can also be characterized as the
9 application of economic analysis to public policy
10 issues, this time in the housing field?

11 A. I believe that is true.

12 MS. SWENARCHUK: I don't propose to
13 review the CV any further. As I indicated, Madam
14 Chair, I am asking that Dr. Muller be qualified as a
15 professional economist and as an expert in the
16 application of economic analysis to matters of public
17 policy including resource management.

18 MADAM CHAIR: Do the parties object to
19 these qualifications?

20 (no response)

21 No. Then Dr. Muller will be so
22 qualified.

23 MS. SWENARCHUK: Thank you.

24 Q. Now, I'll be asking that Dr. Morrison
25 be qualified as a forest policy analyst, forest

1 economics analyst and as an expert in environmental
2 impact assessment.

3 MR. MARTEL: What's the last one?

4 MS. SWENARCHUK: As an expert in
5 environmental impact assessment.

6 MS. SWENARCHUK: Q. And, Dr. Morrison,
7 we see from the CV that your doctorate is actually in
8 zoology from the University of British Columbia. And
9 could you indicate for us what was the subject of your
10 doctoral work?

11 DR. MORRISON: A. Of course. My
12 doctorate was primarily concerned with evaluating the
13 effectiveness of two insects, two species of insects
14 that were introduced as biological control agents in an
15 effort to provide an alternative to pesticide use as a
16 means of controlling weeds in the interior of British
17 Columbia.

18 Q. And I understand that with regard to
19 the areas of expertise that we are proposing that there
20 are three areas in your work and academic and
21 publication experience that qualify for these areas,
22 and I would like you, first of all, to outline for the
23 Board the work experience and publications related to
24 your work with economics -- sorry, with ecology and
25 with environmental science?

1 A. Well, primarily in terms of
2 environmental science background comes from my
3 doctorate research and graduate courses associated with
4 that.

5 In addition, over the last five years now
6 I have been working both as a Professor of
7 Environmental Studies and as a systems ecologist with a
8 consulting group based in Vancouver known as ESSA,
9 Environmental and Social Systems Analysts.

10 In the course of my work at Trent
11 University I carried out research on forest management
12 in Ontario and developed and taught courses in a number
13 of different areas of environmental studies.

14 In my work with ESSA, Environmental and
15 Social Systems Analysts, I've analysed and contributed
16 to the analysis of a number of important environmental
17 problems, including air pollution problems.

18 Impacts associated with --
19 environmental -- impacts associated with clearing of
20 right-of-ways for Ontario Hydro, impacts associated
21 with nuclear generating stations, again for Ontario
22 Hydro, and also impacts associated with projects
23 carried out by the various federal departments.

24 Q. All right. And then another area of
25 your work experience, I understand, has to do with

1 economic analysis and knowledge of decision-making.

2 And I wonder if you could expand slightly on that for
3 the Board?

4 A. Sure. Economic analysis was
5 considered in a number of courses at the graduate level
6 I took at University of British Columbia and I extended
7 my expertise from that in two places; one was in my
8 work between 1983 and '84 as program analyst with
9 Forest Planning Systems and in that context we were
10 developing a model which essentially mimicked the
11 appraisal system that was carried out by the B.C.
12 Ministry of Forests at that time.

13 The second area in which --

14 Q. If I could just stop you there.

15 Could you expand on that slightly please, with respect
16 to your work on that project, the appraisal system used
17 by the B.C. Government, what does that mean exactly?

18 A. Sorry. It involves -- at the time it
19 in involved the use of a set of techniques to try and
20 estimate the delivered wood costs associated with
21 harvesting practices throughout the Province of British
22 Columbia.

23 Q. Go ahead.

24 A. The next area of, if you like,
25 development in my economics expertise came when I

1 worked as a resource analyst with a forest economics
2 and policy analysis project at UBC.

3 In the course of that work I worked on a
4 number of different projects relating to different
5 aspects of the analysis of the Canadian forest sector,
6 analysis of international demand and supply concerns,
7 and analysis of in particular -- my particular area of
8 focus, was on the analysis of the cost of harvesting
9 wood throughout the Province of British Columbia and we
10 tried to develop an estimate of what the distribution
11 wood costs would be for the province.

12 Q. Okay. And then with regard to your
13 expertise in the area of environmental impact
14 assessment, could you summarize your experience in that
15 area, please?

16 A. Yes. Two major ways in which that
17 expertise came about; one was through the course of my
18 graduate work where I carried out essentially an
19 environmental impact assessment of the insects that
20 were introduced as a control agent for the weeds. It
21 involved intensive field work and computer modeling and
22 coming to some conclusions about what the impacts had
23 been.

24 And as part of that work, I also
25 conducted an assessment of how the biological control

1 agents had fared and how effective they would likely be
2 in comparison to the chemical alternative.

3 My environmental assessment expertise
4 also came from research and course development work
5 that I carried out at Trent University. And there I
6 developed and taught a course on environmental impact
7 assessment and included in that course aspects of
8 forest management and policy analysis and economic
9 analysis.

10 Q. And with regard to your publications,
11 Dr. Morrison, I direct the Board's attention to the
12 second page of your CV.

13 First of all, the fourth publication
14 Environmental Impact Assessment in Hinterland Areas,
15 Lakewood/Waterloo Distance Education Projects. Could
16 you indicate what that represents, please?

17 A. That was a course which I put
18 together with two other people, one from Lakehead
19 University and one from the University of Waterloo, and
20 the major -- the course was intended to provide the
21 final ultimate course in a certificate program for the
22 Lakehead/Waterloo Distance Education Project and as
23 part of that course what we did was took the students
24 essentially through three case studies and had them
25 deal with the source material and focus their attention

1 on specific questions relating to the source material
2 in an effort to help them utilize the expertise and
3 training that they had achieved up to that point. So a
4 case study approach to the problem.

5 Q. And I understand that, again with
6 regard to environmental assessment, you have spent the
7 last four and a half years working on computer systems
8 to support Canadian federal agencies doing
9 environmental assessments?

10 A. That's correct.

11 MS. SWENARCHUK: I direct the Board's
12 attention as well to the last six publications listed
13 on that page as well as the final publication listed on
14 the next page, and barring any objections from other
15 counsel I propose not to review the CV further but to
16 ask that he be qualified in the two areas that I
17 specified earlier.

18 MADAM CHAIR: Any objections from the
19 parties?

20 MR. COSMAN: Just one, Madam Chair. And
21 Ms. Swenarchuk has been very careful not to qualify Dr.
22 Morrison as having expertise as a professional
23 economist, and that in mind I have -- although I have
24 some questions about true recognition of some of these
25 other areas of expertise as recognized areas of

1 expertise, with the understanding that he is not
2 qualified as a professional economist, I only let my
3 submissions at the end of the day go to weight and I
4 will not challenge his qualifications.

5 MADAM CHAIR: All right. Dr. Morrison
6 you're -- Mr. Freidin?

7 MR. FREIDIN: Madam Chair, I don't
8 challenge the qualifications but I would advise the
9 Board that I will be asking some questions of Dr.
10 Morrison in relation to his expertise in environmental
11 impact assessment, by way of clarification more than
12 anything else, to determine exactly what that is and
13 perhaps what that is not.

14 MADAM CHAIR: Okay. Dr. Morrison, you
15 are being qualified as a forest policy analyst, forest
16 economics analyst and expert in environmental impact
17 assessment.

18 And one question. Were you involved in
19 any way with the work that ESSA did for the Ministry of
20 Natural Resources?

21 DR. MORRISON: No, I wasn't. That is I
22 understand it was as a result of concerns by the MNR
23 lawyers.

24 MS. SWENARCHUK: Q. And you're not
25 involved at this time with any of the ongoing work that

1 ESSA may be doing for the Ministry; is that correct?

2 A. No.

3 MADAM CHAIR: Mr. Freidin?

4 MR. FREIDIN: That's very factual.

5 MADAM CHAIR: You had raised eyebrows and

6 I --

7 MR. FREIDIN: No, it's factual, it's
8 correct and proper.

9 MS. SWENARCHUK: We are ready to begin
10 then, Madam Chair, and you'll be happy to hear that I
11 will be I think almost totally silent and my witnesses
12 will be explaining their evidence to you and Dr. Muller
13 will begin and he will be using the overhead projector.

14 Is it necessary to dim the lights or can
15 we keep them on?

16 DR. MULLER: I think you should leave
17 that to the audience to decide.

18 MS. SWENARCHUK: Okay. Let's try it with
19 them on and see how it goes.

20 Q. And, Dr. Muller, you'll be starting
21 with Exhibit 1695A; is that correct.

22 DR. MULLER: A. That's correct, although
23 I will be moving quite quickly to 1695B.

24 MR. MARTEL: I thought you were going to
25 say you were going to be moving quickly.

1 MS. SWENARCHUK: And that too, of course.

2 DR. MULLER: Madam Chair and Mr. Martel,
3 before I get into the details of our witness statement
4 I thought it would be useful to try to clarify a number
5 of ideas which lie behind the witness's statement and
6 also try to address, in a preliminary way, the specific
7 questions which I understand you asked on the scoping
8 session.

9 So I would like to make a few preliminary
10 comments and then proceed to the witness statement
11 itself.

12 I'm sure you'll interrupt me if I'm
13 deviating from the path that you would like me to
14 follow.

15 Just as a matter of information, the way
16 in which Peter and I intend to share our testimony, I
17 will make some introductory comments and that will be
18 focused primarily on developing the idea of net social
19 benefit and net public benefit and the idea of net
20 present value.

21 The second part of my personal testimony
22 will be on the second part of the witness statement,
23 environmental economics -- sorry, economic analysis in
24 forest management.

25 Then Peter will -- Dr. Morrison will take

1 over and talk about timber management procedures in
2 Ontario and make some comments on provincial economic
3 issues.

4 Both Dr. Morrison and I examined the
5 Class EA Document with an eye to commenting on its
6 adequacy and both of us have a number of comments we
7 would like to make on the Class EA Document, that will
8 be the fifth section of our testimony.

9 And then I will conclude trying to go
10 through as easily as possible a sample cost/benefit
11 analysis of timber management and forest management on
12 a forest management unit which constitutes Section 5 of
13 our witness statement.

14 And I hope that that example will allow
15 us to see -- get quite a bit of insight into what's
16 going on in some of these questions before the Board.

17 I am now turning to some of the
18 supplementary overheads which are in this package,
19 1695B and, with your permission, I would like to first
20 of all just take a moment to discuss why economic
21 analysis is relevant to the matters before the Board.

22 Quite often people perceive economics as
23 simply the study of the stock market or forecasting of
24 interest rates. There is a field of environmental
25 economics, and that's appropriate because economics has

1 often been defined as the study of the allocation of
2 scarce resources amongst competing ends.

3 So in the case which you have before you,
4 you have an environmental resource, which is also an
5 economic resource; namely the land, the forest land of
6 Ontario and this land has many different uses: it can
7 be used for timber production, it can be used as a
8 repository for genetic information, it can be used for
9 recreation, so it has multiple uses.

10 And the challenge is to decide whether or
11 not the most appropriate uses are being made of the
12 environment, of this environmental asset, and so I
13 would suggest to you that it falls within the class of
14 questions which is studied in economics as a study in
15 allocation of scarce resources amongst competing ends.

16 I should stress that there's not enough
17 forest land apparently to provide all the timber and
18 all the wilderness recreation and all the fishing and
19 hunting that everybody seems to want, so it's a matter
20 of deciding where it's best used.

21 A second item is important. When we use
22 the forest to produce timber or to produce other
23 services such as recreation, normally we use manpower
24 and womanpower, we use labour, and we also use the
25 services of capital, we have to make investments.

1 And the labour and capital that we have
2 available in Ontario is limited as well and we would
3 like to use it for many different purposes. We would
4 like to use it for adequate health care, we would like
5 to use it for good education, and so the issue of
6 whether or not we are using our scarce labour and
7 capital appropriately in the management of our forest
8 resources is also a question of the allocation of
9 scarce resources amongst competing ends, and so it
10 falls, I believe, in the province of economics.

11 Madam Chair, in our witness statement,
12 lying behind our witness statement there are some ideas
13 which weren't addressed explicitly but which I think
14 probably should be brought out at this point.

15 The first one I wish to look at is that
16 in judging what the best allocation of scarce resources
17 is, whether they're environmental resources or other
18 resources, economists tends to concentrate on two
19 things; one is the amount of national income, and the
20 other is the distribution of national income to
21 individual people in the community.

22 Now, by national income I mean the value
23 of all of the goods and services that Ontario people
24 have to consume. So that would include both haircuts
25 and pizzas which are obvious services -- goods and

1 services, it would also include the recreation that we
2 derive from the forests, and it would also include the
3 value that the forests provide us in maintaining
4 ecological values such as biological diversity or
5 drainage patterns or all of the concerns which you've
6 heard in earlier testimony. So I would include in
7 national income all of these things.

8 Now, national income for the economy is
9 sort of like a pie. I'm sure you've heard this
10 analogy: national income is like a pie which is
11 available to the community to eat and we are interested
12 in both how big the total pie is and we are interested
13 in the size of the piece that each individual gets to
14 eat.

15 And the first question: How big is the
16 pie, is the question of allocation of resources; and
17 when economists talk about economic efficiency they
18 are're to make the pie as big as possible. The problem
19 of making sure that everybody gets a fair share of the
20 pie, a good slice so to speak, is the question of
21 distribution of income.

22 Now, I make this distinction because it's
23 useful analytically to distinguish between allocation
24 questions where you're trying to maximize the size of
25 the pie and distribution questions where you're

1 concerned with who's getting what slice.

2 It's useful analytically, although we
3 know that these are completely tangled up together and
4 so that in practical problems it will be foolish to
5 deny that both questions are an issue.

6 So, for example, moving employment from
7 one occupation to another occupation might increase the
8 size of the overall pie, but if we are not careful it
9 could diminish the size of the slice that the
10 individual person gets and I think both of those issues
11 are important questions to public policy.

12 Now, Madam Chair and Mr. Martel, I think
13 that this is important because it comes close to an
14 issue which I know you're concerned about which is the
15 role of jobs and employment in an environmental
16 assessment.

17 I think the real problem with the job
18 issue in an environmental assessment is that it's
19 connected, the job issue is connected both with
20 allocation and with distribution, so -- and the real
21 problem is the one that I just alluded to, the
22 possibility that by reorganizing our employment of
23 labour we might increase the overall size of the pie
24 and yet leave some people with a diminished slice of
25 the pie, so that leaves some people worse off than they

1 were before.

2 Now, in principle, if the pie is really
3 bigger, if we really have increased national income,
4 then it should be possible to cut the pie up in such a
5 way that nobody is worse off. And so, for example --
6 and this principle has led some economists to argue
7 that what we should do is completely separate the two
8 issues. You should look at allocation, you should
9 maximize the size of the pie through the examination of
10 the allocation of resources, and then you should leave
11 the distribution every national income up to public
12 policy operating through the tax system, the special
13 grants, I guess using the tax system, the subsidy
14 system to redistribute national income.

15 I'm not sure that I would advise you to
16 adopt that position completely, but I do think it's
17 very important when you're thinking about jobs, and I
18 say this with respect and I say it with respect to
19 economic analysis not with respect to legal decisions.
20 I do think you've got to be quite clear about whether
21 you're making a judgment on allocative grounds, that
22 is, on whether the pie is being maximized, the size of
23 the pie is being maximized, or whether you're making a
24 judgment on distribution.

25 If you're concerned with allocative

1 issues, you're concerned with getting the biggest
2 possible pie, then it's appropriate to look at the --
3 compare the results of different forest management
4 methods, in particular, of course we're going to be
5 thinking about modified harvesting, natural
6 regeneration methods, compared to large area
7 clearcutting and artificial regeneration methods.

8 So if you're judging this question on
9 allocative grounds, it's important to compare these
10 various methods and see which method leads to the
11 largest pie so to speak.

12 But if you're judging the issue on
13 distributional grounds, then I think what you have in
14 mind is, we are making public expenditures to support
15 the forest industry and that has created jobs and that
16 is giving people income. And I think then the question
17 you really have to address is whether this is the best
18 way of providing jobs and incomes to northern Ontario
19 residents.

20 And, in particular, you have to ask
21 whether or not the kind of expenditures we're seeing on
22 forest management are as good as, let's say, direct
23 expenditures on housing or nursing care or community
24 health of any kind. In other words, once you start
25 considering distributional questions I believe it's

1 encumbent on you to look at a wider range of options
2 than just two or three options of forest management.

3 If you don't mind my just emphasizing
4 that point, that last point.

5 Ms. Swenarchuk showed me a letter which
6 the Minister of Natural Resources has recently written
7 this Board and which I consider -- I understand you
8 spent some time discussing. In this letter on page 2
9 of the letter from Mr. Wildman, Mr. Wildman states:

10 "Given the current economic conditions
11 and the financial position of the
12 government, I am not yet certain how
13 quickly we will be able to proceed on all
14 of these initiatives in the next fiscal
15 year."

16 That was with respect to a number of
17 initiatives with respect to forest management. What I
18 wanted to emphasize was that any government faces
19 serious constraints on the number of projects it can
20 finance and undertake and it's important for the
21 government to allocate its limited funds in the most
22 appropriate way.

23 Madam Chair, another issue that I know
24 you were particularly interested in is the evaluation
25 of non-timber benefits or non-timber uses. We address

1 this question in the appendix to our report and also we
2 made a number of comments in our reply to the Ministry
3 of Natural Resources Interrogatory No. 14. I would
4 like to amplify one or two ideas, if you would permit
5 me.

6 When we talk about true national income,
7 true benefit, we really include -- or we can think of
8 ourselves as including three groups of goods or
9 services, there is the easily measured goods and
10 services like haircuts and pizzas --

11 MR. FREIDIN: I'm sorry?

12 DR. MULLER: Easily measured things like
13 marketed beer and pizza, those are my examples for my
14 class. There is not really a big problem in
15 incorporating them into a measure of the value of
16 national income.

17 Then there are goods which are not
18 marketed or services which are not marketed but which
19 aren't too hard to evaluate and I'm thinking, for
20 example, of the pleasure that people get out of being
21 able to use Crown land for recreation.

22 In principle you can ask them -- you can
23 survey people who are actually undertaking recreation
24 and you can ask them questions like: Suppose the cost
25 of gasoline had risen so much that it costs you a

1 hundred dollars a day more to undertake this trip would
2 you still have undertaken it? If they say yes they
3 would still have undertaken it, then you could say the
4 trip was worth at least a hundred dollars to them.

5 Now, this is the method -- the so-called
6 method of contingent valuation, or contingent
7 evaluation and there has been a rapid development of
8 this technique, especially in the United States over
9 the past decade or so and some of the articles in our
10 source book refer to this method.

11 The Canadian Wildlife Service survey of
12 the value of wildlife to Canadians which was discussed
13 by Dr. Payne in witness statement No. 4 and in evidence
14 before you, which I've had the chance to look at
15 briefly, is an example of the application of contingent
16 evaluation methods to the Canadian experience. It's
17 not specifically directed at northern Ontario, but as
18 part of the survey that was discussed by Dr. Payne
19 estimates were made of what the survey calls direct
20 benefits to hunters and non-consumptive participation.

21 For example, they estimated - I believe
22 it's in the 1981 survey - they estimated that hunters
23 received direct benefits of \$232 per hunting trip,
24 which means that those hunters would have been willing
25 to undertake that hunting trip even if it had cost them

1 \$232 more than it really did, and so that is a measure
2 of the direct benefit that they get from the ability to
3 hunt.

4 So there are examples of estimating the
5 value of non-marketed services which are practical,
6 they can be implemented and they have been implemented
7 in Canada, although I'm not aware of specific studies
8 in the area of the undertaking.

9 Now, that leaves a third group of
10 services. I said the first group was marketed goods
11 and services like beer and pizzas, the second group was
12 services such as recreation, the third group I'm
13 thinking of are services like the services provided by
14 old growth forests as a repository of genetic
15 information, as a particular kind of habitat, as a
16 particular kind of environment that people would like
17 to have around.

18 Now, in principle the value of those
19 services ought to be considered as part of national
20 income, it's what I'd call true national income, but
21 it's -- and I should also say it would be possible to
22 survey people and ask: How much are you willing to see
23 your taxes increase in order to maintain old growth
24 forests in Ontario.

25 MR. MARTEL: Can I ask a question?

THE WITNESS: Sure.

MR. MARTEL: How reliable are those things where you ask someone to tell me, and the difference they would actually go out there and be prepared to spend?

DR. MULLER: Well, there was considerable work done, especially in the United States, on the reliability and the stability of these estimates and there has been investigation of various biases.

For example, if you think that you really are going to pay, you may be inclined to reduce the estimate that you say; and if you think you're not going to have to pay, you may be prepared to expand it.

I think it's fair to say that people feel that strategic bias, which is the kind of lying I just referred to, isn't too big a problem if the questionnaire is very accurately set up. So that you can provide people with information, you provide people with information about how much they're paying for education, for roads, for various other public services, and you might ask them how they would relate their own preferences to what they know they're already spending on these other items.

As I say, it's become a real growth industry in environmental economics. There is a

1 research institution called Resources for the Future in
2 the United States which has just brought out a book
3 recently on evaluating the contingent evaluation method
4 which is a textbook, almost a textbook in using it.

5 So I think it's fair to say that it
6 repays investigation and further research and that we
7 certainly can get some kind of estimate of magnitude,
8 and if these estimates tell us that it's worth
9 \$10-million then we know it's not worth 150-million or
10 2-billion and we know it's worth more than ten.

11 Sorry, I've gone on much longer than I
12 should.

13 The point I wanted to make with respect
14 to this is that there's an alternative way of dealing
15 with these values which you should use in conjunction
16 with trying to measure them directly.

17 MR. FREIDIN: Sorry. Are we talking
18 about the third set of values now?

19 DR. MULLER: The third set of values.

20 MR. FREIDIN: Thank you.

21 DR. MULLER: It's possible for us to say
22 how much of our crudely measured national income we
23 have to sacrifice in order to achieve these values.

24 For example, suppose we argue that using
25 modified harvest methods on a particular tract of land

1 will cost a million dollars a year, but -- that is, the
2 costs will be a million dollars higher than they would
3 be on the cheapest possible way of harvesting this
4 timber, you can then ask yourself: Are the losses in
5 old growth forest, the losses of the ecological values
6 which you've heard testimony on: Are they worth a
7 million dollars a year, at least a million dollars a
8 year.

9 As soon as you're prepared to say that,
10 yes, we think that Ontario's society at large is
11 willing to pay at least a million dollars a year to
12 achieve these benefits, then it would seem appropriate
13 to require the modified harvest technique rather than
14 the clearcutting technique.

15 So what I'm trying to suggest is that
16 when you're faced with those really tricky questions
17 about how do you deal with these broad, broad issues,
18 one question you can ask is: How much does it really
19 cost us in crudely measured national income to achieve
20 these goals. And you can then use that information to
21 try to decide whether it's clearly worthwhile or
22 whether it's clearly not worthwhile.

23 MS. SWENARCHUK: Q. Dr. Muller, just one
24 question now. You outlined for the Board I think three
25 different categories of types of goods and services to

1 be considered.

2 If I can summarize it briefly, marketed
3 services, non-marketed but quantifiable goods and
4 services, and then non-marketed and not easily
5 quantifiable goods and services.

6 Now, when we see in the witness
7 statement -- for example, I'll read this briefly. I
8 don't think you need to turn to it. On page (ii) in
9 the executive summary you have defined net social
10 benefit:

11 "The net social benefit derived from the
12 forest may be considered its
13 contribution to national income properly
14 measured."

15 Does national income properly measured,
16 as you use it in the witness statement, refer to those
17 three different categories of goods and services?

18 DR. MULLER: A. Yes. I am using the
19 phrase, which is my own, national income properly
20 measured to include all three groups of services, and
21 the reason I'm using the phrase national income
22 properly measured is to try to make it easy for
23 non-economists to get a feeling for the concept that is
24 being addressed.

25 Technically there are a number of

1 important questions raised by the definition that I
2 have made and, in fact, technical economists have tried
3 to avoid the use of national income and they talk only
4 about economic efficiency, but I believe that it's
5 worthwhile to provide a general view of what's going on
6 the way that I have tried to.

7 Madam Chair and Mr. Martel, if you have
8 no further questions, those are my introductory
9 comments and I would like to proceed to discussing the
10 economic analysis of forest management which we review
11 in Section 2 of our witness statement.

12 MS. SWENARCHUK: Q. And for this
13 purpose, Dr. Muller, will you be referring now to
14 Exhibit 1695A, the outline of evidence?

15 DR. MULLER: A. That's correct. And I
16 notice that one of my overheads is out of sequence and
17 I can't find it.

18 I'm now -- the one I'm looking for is the
19 second sheet of that handout which says that the basic
20 principle that we wish to follow in our testimony is
21 that for an economist, on the basis of economic
22 analysis, the requirement that we manage our
23 environment wisely implies to us that we should
24 allocate the forest land to its most highly valued use.

25 And by the most highly valued use - and

1 I'm still looking at the second page of that collection
2 of overheads in 1695A - we want to make sure that when
3 we talk about the most highly valued use we include all
4 the uses of the forest, we're talking about socially
5 most highly valued use which may differ from the use
6 which is most highly valued by some individual private
7 agent.

8 When we talk about the most highly valued
9 use we're really talking about the use which maximizes
10 the net present value of the benefits that we receive
11 from the resource. I notice from the evidence that
12 many people talk about net present worth and it's
13 essentially the same thing. I believe it's fair to say
14 that net present value and net present worth are
15 complete synonyms.

16 And we want to emphasize that the best
17 use of the land may vary geographically. What's right
18 in the near north may not be right in the far
19 northwest; what's right near lakes which have high
20 recreational potential may not be what's right in other
21 areas.

22 Similarly we know that there's a desire
23 to have multiple-use management or integrated resource
24 management, combining recreation and timber management
25 in one area may be the best use, that is, it may yield

1 the highest net present value, or it may not, it's
2 something which should be investigated empirically.

3 I might just note, Madam Chair and Mr.
4 Martel, that the U.S. National Forest Management Act
5 requires that each national forest in the United States
6 be managed to maximize net public benefits, and I would
7 interpret the phrase net public benefit to be the same
8 as the phrase net social benefit that I use and Dr.
9 Morrison uses in our document.

10 So when people talk about maximizing net
11 public benefit in the United States, I would interpret
12 them as talking about the same thing that I'm talking
13 about when I say maximize net social benefit.

14 MR. MARTEL: All right.

15 DR. MULLER: Now, the theme -- the
16 overall theme that we would like to establish in our
17 statement is that the procedures provided in the Class
18 Environmental Assessment are not likely to allocate
19 land to its most highly valued use and that is, I
20 think, the essence of our concern about the
21 environmental assessment statement.

22 We believe that alternative procedures
23 are available; that is to say, we think that you could
24 have a procedure which takes more fully into account
25 the various uses of the environment and directs them to

1 their most highly valued use.

2 And the procedure that we recommend most
3 strongly, I think, is what I would call social
4 cost/benefit analysis. And I think it's fair to say
5 that an important message of our witness statement is
6 that social cost/benefit analysis conducted at the
7 level of the forest management unit is a practical way
8 of trying to determine the most highly valued use of
9 particular forests.

10 And please interrupt me if I'm not making
11 myself clear, going too slowly or going too quickly.

12 Madam Chair, the concept of net present
13 value is so important and the room for confusion is so
14 great that I hope you will indulge me in taking you
15 through a number of simple examples to try to emphasize
16 or try to give you an even better feeling for what is
17 meant by net public benefit and net social benefit.

18 MS. SWENARCHUK: Q. Dr. Muller, I'm
19 having a request here for you to speak up a little,
20 please.

21 DR. MULLER: A. I'm sorry.

22 Q. You have a keen audience.

23 A. I was saying that I would like to
24 develop these important ideas through some examples and
25 I would like to, in particular, emphasize that

1 sometimes we can allow private individuals to make
2 decisions which will maximize net present value but
3 other times we can't.

4 And this has to do with essentially the
5 role of government and whether or not we can allow
6 private individuals as represented by forest companies
7 to make the appropriate decisions for the maximization
8 of the net present value of our forests.

9 Now, in doing this I would like to
10 develop a series of examples about agriculture. Now, I
11 have chosen agriculture and not forestry, first of all,
12 to emphasize the idea that it's a conceptual problem
13 that I'm trying to address rather than the details of
14 forest management, which we will address in our case
15 study; and, secondly, because I want to keep away from
16 the problems involving time for as long as I can
17 because there are some important problems of forestry
18 associated with discount which I want to avoid for just
19 a moment.

20 Now, I am moving to the fifth page of
21 Exhibit 1695A to an overhead which starts off, Example
22 1, Agricultural Land. And the purpose of this example
23 is to illustrate a simple case in which a private
24 individual will make a choice which maximizes the net
25 present value of the land.

6 Now, it's important to remember that the
7 inputs we use could have been used somewhere else; for
8 example - I hope Mr. Martel will forgive me - the
9 labour can be used to mine nickel and the fertilizer
10 might be used to grow carrots I suppose in southern
11 Ontario.

12 Now, of course, I'm using these specific
13 examples only for the purposes of illustration, we
14 don't usually know precisely what the other use of the
15 labour and fertilizer is.

16 Now, as is required by the Environmental
17 Assessment Act so is it also required in economic
18 analysis to consider the alternative uses of the land.
19 And the three alternative uses I would like you to
20 consider in this very simple example are not to use it
21 at all, that is the null alternative, leave it fallow,
22 no inputs no outputs; or use it to grow potatoes, and
23 let us suppose that we could grow a thousand dollars
24 worth of potatoes with no fertilizer and \$400 worth of
25 labour.

1 I make no claim for the realism of these
2 numbers, they are only meant for illustration.

3 Let's suppose that alternatively we can
4 grow corn on the land for \$1,200 and use \$400 worth of
5 fertilizer and \$300 of labour in doing so.

6 Can you hear me all right?

7 Now, I am going to move on to my next
8 overhead which is labeled Example 1 Private
9 Cost/Benefit Analysis, and what I am trying to show you
10 here is that there are two types of cost/benefit
11 analysis that one might do with respect to the choice
12 of these alternatives.

13 On the one hand we could picture a
14 farmer, a private individual doing a private
15 cost/benefit analysis. That private individual would
16 get a benefit from growing a crop and that benefit
17 would be easily measured by the value of the potatoes
18 or the value of the corn; \$1,000 in the case of
19 potatoes, \$1,200 in the case of corn.

20 The private individual would have to pay
21 for the labour that was used and the fertilizer that
22 was used and the private individual would derive what
23 we would normally call a profit, but which I'm calling
24 here the net private benefit. The individual would
25 derive a net private benefit of \$600 from potato

1 production and \$500 dollars from corn production.

2 Now, that individual would say to himself
3 or herself, the net -- the value of my land is zero if
4 I leave it fallow, it's \$600 if I use it for potatoes
5 and it's \$500 if I use it for corn, and the highest
6 valued use is potatoes so I will allocate my land to
7 potato production and that's what's meant by putting
8 land into its highest valued use.

9 Now, on the bottom of this overhead we
10 have what appears to be almost the same set of numbers,
11 it is the same set of numbers but they are labeled
12 slightly differently and I am labeling them differently
13 because I am now thinking of a social cost/benefit
14 analysis which tries to take into account the total
15 increase in the size of the economic pie that's
16 available from this allocation decision.

17 In this case the social benefit is the
18 fact that society, the community has more potatoes or
19 more corn, and we're measuring that benefit by the
20 value of the corn or the potatoes. So the value of the
21 crop is the same in both the cost/benefit -- in both
22 the private and social cost/benefit analyses.

23 What's interesting is in the line that I
24 have called social cost, because now the \$400 worth of
25 labour is labeled foregone nickel, and the reason

1 that's labeled foregone nickel is that there is an
2 economic principle that the \$400 worth of labour that
3 you were using to produce potatoes could have been used
4 somewhere else and its earnings in its other occupation
5 reflect the amount of nickel that it would have
6 produced.

7 So there is this economic principle which
8 suggests that society as a whole gives up \$400 worth of
9 nickel because we're using this labour to produce
10 potatoes.

11 So now the net social benefit of \$600 is
12 seen to be the difference between the value of the
13 potatoes that we get less the value of the nickel that
14 we have given up. So we say there's an opportunity
15 cost of using the labour, we have given up some nickel
16 and the net social benefit, and the amount by which the
17 pie has gotten bigger is \$600 in the case of potatoes
18 and \$500 in the case of corn.

19 Now, Madam Chairman, I would like to turn
20 to the notes on Example 1 when you're ready. There are
21 a number of points that I would like to make. I will
22 leave the overhead of the numbers up.

23 First of all, I would like to point out
24 that when we use the term net social benefit, it's
25 essentially the same thing as the social value of the

1 land. The net social benefit that we get out of this
2 land is the same thing as the social value of the land
3 in its highest valued use.

4 The second thing is that the value of
5 this land, this \$600 if we use it for potato
6 production, is land's contribution to national income
7 which is a theme which comes up in the witness
8 statement.

9 The fact that we have this land available
10 and that we're using it to produce potatoes rather than
11 doing nothing allows the economic pie to be bigger by
12 \$600. It gives us a thousand dollars extra potatoes
13 but we have to take away the \$400 of nickel and that
14 leaves us a net social benefit or net increase in
15 national income of \$600.

16 See the best way of thinking about how
17 valuable this land is, is to think -- or to ask: What
18 is the net social benefit that we get from using the
19 land.

20 Now, for purpose of reference, I know
21 that you've had testimony at various stages in which
22 people throw around the terms, well, what's the value
23 of wood, and it must be immense, and let me point out
24 that this little example allows us to say that the net
25 social benefit of the land is not equal to the thousand

1 dollars worth of potatoes that it grows, or the \$1,200
2 worth of corn because that neglects the fact that if we
3 grow potatoes or grow corn we have to use resources
4 like labour.

5 Secondly, net social benefit doesn't
6 contain the value of the labour and the fertilizer,
7 that's because those resources are assumed employable
8 elsewhere. So it doesn't really matter whether they're
9 being used here or somewhere else they're still earning
10 their income.

11 In this particular example net social
12 benefit is equal to net private benefit, and that is a
13 result that economists have fallen in love with for 150
14 years. It allows the most conservative economist to
15 say, we shouldn't interfere with the economic system at
16 all, we should just manage everything on a profit basis
17 and individual decisions will lead to the maximization
18 of the economic pie.

19 Now, I want to warn you that the rest of
20 my examples are directed at establishing why we can't
21 always rely on this result. So that we have to have a
22 balance that we have to undertake, we have to realize
23 that sometimes private decisions will work well in
24 maximizing the size of the economic pie, and sometimes
25 they won't.

8 DR. MULLER: Madam Chair, the first
9 example I have is design -- the second example I have
10 labeled Example 2 is designed to show that private
11 decisions can be distorted by public policies. And the
12 case I'm analysing right now is the case of a subsidy.

13 You will recall that I suggested in my
14 little example that we need fertilizer to grow the
15 carrots. Let's suppose that the government pays a
16 subsidy to the farmer equal to the cost of the
17 fertilizer. So my additional assumption is that the
18 fertilizer is paid for by the government.

19 Now, a private individual looking at this
20 cost/benefit analysis will conclude that the net
21 private benefit of growing corn is \$900, it used to be
22 \$500 but now the private costs are less because
23 somebody else is paying for the fertilizer.

24 So if the private individual thinks he
25 makes a profit of \$900 growing corn and only \$600

1 growing potatoes, the private individual is likely to
2 choose corn production.

3 But the social cost/benefit analysis is
4 unchanged. We still had to give up the carrots
5 somewhere else in the economy that might have been
6 grown by the fertilizer. So here we have a situation
7 in which the net social benefit is maximized by growing
8 potatoes, but the private benefit is maximized by
9 growing corn.

10 MS. SWENARCHUK: I would suggest you
11 conclude there, Dr. Muller, and begin with your notes
12 on this example after lunch.

13 DR. MULLER: Certainly.

14 MADAM CHAIR: All right, fine. The Board
15 will be back at 1:30.

16 Thank you.

17 ---Luncheon recess at 12:00 p.m.

18 ---On resuming at 1:35 p.m.

19 MADAM CHAIR: Please be seated.

20 Dr. Muller?

21 DR. MULLER: Madam Chair, when we broke
22 we were just looking at the Example No. 2 on subsidy,
23 and the main point of this example was that once you
24 start complicating the issues at all, private decisions
25 can no longer be counted to maximize -- counted upon to

1 maximize net social benefit.

10 Now, on Exhibit 1695A, the next page is
11 notes on Example 2, and I wanted to just review a few
12 of the things we might learn from, this little example.

13 One is that in this particular case the
14 social ranking of values remained unchanged, it remains
15 socially preferable to choose the potatoes rather than
16 the corn, but that the private ranking of these two
17 alternatives have changed, and that is what economists
18 mean when they say resource allocation is distorted.
19 What they mean is that the private individuals have
20 chosen an allocation which does not maximize social
21 benefits.

Now, an interesting way of trying to emphasize that is to point out to you that if we were to choose corn production rather than potato production in this example we would, in effect, be reducing

1 national income, and I have on that overhead which I
2 referred you to just an example of how that calculation
3 would be done.

4 I want to suggest to you that the private
5 decision which involves producing corn instead of
6 potatoes, that is allocating land to corn production
7 rather than potato production, reduces national income.

8 Now, notice that the value of the crop
9 has actually gone up because the land in corn
10 production produces \$1,200 worth of crop, whereas the
11 potatoes were only worth a thousand dollars. So one
12 might say, ah-hah, this is a better use of the land
13 because the value of the crop has gone up.

14 In my example corn production required
15 less labour than potato production, so we can actually
16 credit the corn production with a hundred dollars, we
17 only give up \$300 worth of nickel in this example
18 rather than \$400. So there's a gain of \$300 in
19 producing corn rather than potatoes.

20 But we're still using that fertilizer and
21 we're still giving up the \$400 worth of carrots that we
22 might have made with the fertilizer, and so the net
23 change in the total value of output, the net change in
24 national income has gone down. The net change is
25 negative, national income has gone down. And what that

1 means is that the misallocation of resources has
2 reduced the size of the social pie.

3 And the idea that I want to emphasize is
4 that when we produce less national income we have got
5 less to go around to meet everybody's wants and
6 desires. So that because the economy is producing less
7 product, it has less money available for investing in
8 such things as health care or education or other social
9 opportunities.

10 If you wish I'll proceed to Example No. 3
11 which tries to develop another example that economists
12 feel is important in this discussion.

13 The overhead I am displaying now is the
14 tenth page of 1695A and it's headed External Costs.

15 MR. COSMAN: Page 9?

16 DR. MULLER: It's the tenth page. It's
17 labeled with a 9, a circled nine, that's because the
18 very first page had no number. I'm afraid the numbers
19 on the slides were from a previous class where I tried
20 out this lettering.

21 Let us suppose -- now we try to bring in
22 the environment. Let us suppose that because we're
23 using fertilizer in one case it encourages algae growth
24 and it reduces the fishing value of the local area,
25 it -- algae growth is unpleasant to look at and so it

1 reduces the aesthetic value of the area, and let us
2 further suppose that we can conduct some surveys and
3 the result of that survey is that people on balance
4 would be willing to pay \$350 dollars to avoid the
5 damage.

6 Now, when I say this, there might be a
7 thousand people affected each of who was willing to pay
8 35-cents; that is, this is the aggregate willingness to
9 pay to avoid the damage.

10 Now, if we return to our cost/benefit
11 analysis and we compare what's going on in the private
12 cost/benefit analysis with the social one, we see that
13 the private cost/benefit analysis is unchanged, nothing
14 has happened here which will change the profit from the
15 point of view of the individual farmer. So the
16 individual farmer still wishes to produce corn and earn
17 a net private benefit of 900.

18 If we look at it from a social viewpoint
19 we still get the same value of the crops in the two
20 cases, we still have the lost nickel and the lost
21 carrots; that is, we still have the opportunity costs
22 of the fertilizer and the labour and, in addition, we
23 have caused some environmental damage.

24 So the way this is reflected in our
25 social cost/benefit analysis is that the net benefit

1 from potato production is unchanged but the net benefit
2 from corn production is even lower. So what I'm saying
3 here is, in this particular example, the additional
4 environmental damage makes corn production look even
5 worse than it did before.

6 Now, I'm going to turn to the overhead
7 which says Notes on Example 3 and just point out a few
8 ideas that this example illustrates.

9 The first idea is that including the
10 environmental damage reduced the net social benefit
11 that we get from the corn. It used to be 500, now it's
12 150. But what I call the social ranking of the option
13 is unchanged because we would have chosen potatoes
14 anyway, it doesn't matter that corn is even less
15 attractive than it was before.

16 The conclusion I draw from that is that
17 it's not always necessary to value environmental
18 damage. Sometimes putting an explicit value on
19 environmental damage will not add anything to our
20 decision, sometimes we already know on other grounds
21 that it's not wise to grow the corn.

22 The third thing that this example
23 illustrates is the idea that monetary values can be
24 placed on environmental damages. Here I estimated them
25 by this survey indicating willingness to pay. So it's

1 possible to put a monetary value on some environmental
2 damages.

3 And finally, this is a good time to bring
4 in the point that the national income that we see
5 reported by Statistics Canada is not always a good
6 measure of what I've called true national income, and
7 the reason behind that is that national income as
8 measured by the statistical agency doesn't usually
9 include items such as the lost value of the
10 environmental services.

11 So in this case if we choose corn
12 production we'll lose \$450 worth of social value but
13 the national accounts will only go down by a hundred;
14 that is, remember before we had the \$350 of
15 environmental damage, the corn had a net social benefit
16 of \$500, so moving from potatoes to corn reduced
17 national income by 100.

18 Now, if we look at the reduction in net
19 social benefit by misallocating resources, we lose \$450
20 but not all of that will show up in the crudely or
21 simply measured national accounts.

22 Now, if you wish me to go on to my next
23 example, I want to move to the bundle of exhibits
24 called 1695B, and on the third page of that example you
25 will find Example 5. And I'm afraid that the

1 reproduction is not good. Perhaps we can do something
2 about that.

3 Madam Chair and Mr. Martel, I drew up
4 this example to try to illustrate what's going on when
5 there's a problem in employment of labour, so that the
6 labour employed in one activity has a hard time finding
7 an equally well paid job somewhere else. I've called
8 this Example, Lower Paid Replacement Jobs.

9 And in this case I'm going back to my
10 very first example, Example No. 1, to make it simpler.
11 And the only difference I'm making is I'm assuming that
12 labour, that is the people working on the farms, earn
13 \$10 an hour if they work in agriculture but their other
14 other job, their best alternative job will only pay
15 them \$5. And what I'm interested in is what this does
16 to the concept of net present value or net social
17 benefit.

18 As you can see, the private cost benefit
19 analysis is unchanged, we still have benefits of a
20 thousand dollars for potatoes and \$1,200 for corn,
21 private costs of \$400 in labour for potatoes and \$300
22 in labour for corn, and the cost of the fertilizer. So
23 nothing has changed in the private calculation.

24 But from a social point of view, because
25 the workers would receive only half as much money if

1 they were working in the nickel production area, we
2 apply the same principle that I referred to earlier and
3 we say, the amount of nickel that we're giving up in
4 the rest of the economy is less, it's only \$200, it's
5 only half of what it appeared to be before.

6 So the big distinction is that in the
7 private cost/benefit analysis I put a value on labour
8 equal to what I have to pay it, but in the social
9 cost/benefit analysis I put a value on labour of what
10 it could earn somewhere else, and that reflects we hope
11 the amount of output that it could have earned in the
12 other area.

13 Now, when I calculate net social benefit
14 it turns out that the net social benefit of potato
15 production has risen from 600 to 800, and the net
16 benefit of corn has risen from 500 to 650.

17 I am now going to turn to the overhead
18 labeled Notes on Example 5 and simply point out the
19 lessons I draw from this example.

20 The first -- these are lessons to draw
21 when the current wage, that is the wage you're paying
22 your workers in a particular activity, exceeds the
23 alternative wage, that is the wage that they would be
24 making if they didn't have this job but they had to
25 have some other job.

1 Now, the lessons I draw from this are
2 that the private cost overstates the social cost, and
3 the private benefit understates the net social benefit.
4 So that we saw in the numbers that the net value of
5 both potatoes and corn rose.

6 I'm sorry, I'll just put that back. The
7 net private benefit of potatoes was 600, it rose to
8 800; the net private benefit of corn rose from 500 to
9 650. So that when we have unemployed resources it
10 turns out that the net benefit of this activity is
11 higher than it appears to be on a private cost
12 calculation.

13 There's a couple of other lessons we can
14 learn though. One is that the ranking of projects
15 doesn't always get affected when we make these
16 corrections, so that -- I've rigged this example so
17 that it continues to be socially desirable to produce
18 corn -- sorry, produce potatoes rather than corn
19 whether you do a private cost/benefit or a social cost
20 benefit. Now, I've rigged the example to do that, but
21 the point I'm trying to establish is that making these
22 corrections doesn't always change your decision.

23 The other idea that we can learn from
24 this is that it is feasible to adjust a cost/benefit
25 analysis; that is, you can take -- you can start with

1 private costs and benefits and you can adjust the
2 private cost/benefit to get a social cost/benefit
3 analysis, and the way you do that is to use an
4 artificial price for the inputs that we're talking
5 about.

6 In this particular case we use what's
7 called a shadow price on labour; that is to say, in
8 calculating the net social benefit of potato production
9 we pretended that labour was receiving a payment of
10 only \$5 an hour rather than \$10 an hour, and that's
11 called using a shadow price of labour, and the effect
12 of that, in this case, was to raise the apparent net
13 benefit of growing both potatoes and corn.

14 Now, you can see, of course, that this is
15 directly relevant to the question of what happens if we
16 have highly paid job opportunities in some community
17 that can't be replaced by equally high paying job
18 opportunities.

19 Well, Madam Chair, the last example along
20 these lines - it will be quite a brief one - is Example
21 No. 6 which is still in Exhibit 1695B and the overhead
22 here is entitled: Raising the true net social benefit
23 while reducing measured net social benefit.

24 And what I'm trying to do here is give
25 you an example of a point that I made earlier. You'll

1 recall that I said there were three classes of services
2 that you might count in true national income, and that
3 the third class was the group of services that it's
4 very difficult to evaluate.

5 Now, suppose that we have a situation in
6 which we have the same thing as Example 1, potatoes
7 erode the soil and corn doesn't. Again, this is purely
8 for purposes of illustration. Then I have a social
9 cost/benefit table that looks something like this. I
10 have quantified benefits, a thousand for potatoes,
11 1,200 for corn; I have quantified costs 400 and 700,
12 and I have a measured net social benefit of 600 for the
13 potatoes and 500 for the corn.

14 In addition, I have to point out to
15 people that when we have the potatoes we have some
16 erosion and when we have the corn we have no erosion.
17 So I've listed this in the overhead as an unquantified
18 or an - unevaluated would be a better term - an
19 unevaluated benefit.

20 Now, the point is that we can avoid the
21 erosion by choosing corn production. In this case, if
22 we choose the corn production, then we've reduced our
23 net social benefits as measured by a hundred. So as
24 long as we're prepared to say, we don't know exactly
25 what benefit we're going to put on erosion but we know

1 it's more than a hundred dollars, then we should choose
2 the corn production rather than the potato production.

3 So this is a simple example of the
4 principle I was trying to establish earlier, that
5 sometimes it's necessary to say we don't know how much
6 of a value to put on environmental services, but we can
7 figure out how much it's going to cost in a crude way
8 to get it.

9 Madam Chair, I am going to turn now to my
10 summary which is the next page of Exhibit 1695B, the
11 overhead says Summary of Agricultural Examples. And
12 here I simply want to review very quickly the basic
13 ideas that we have established.

14 First of all, the social benefit of any
15 activity, according to this way of looking at things,
16 is the value of the increased outputs that we get from
17 that activity, the social cost of whatever it is is the
18 value of the things that we give up and we usually call
19 that the opportunity cost of inputs. So we've got --
20 whenever we do something we get increased outputs which
21 have a value, that is the social benefit; and we give
22 up things, that is the opportunity cost. And the net
23 social benefit of the land is the difference between
24 the social benefit and the social cost, and I've argued
25 that that's our contribution to true national income.

18 MR. MARTEL: What's the second one?

19 Subsidies, the second one was?

20 DR. MULLER: The two big ideas were
21 subsidies and external costs and benefits, and you'll
22 remember the external cost example was when the
23 fertilizer caused algae growth and that was causing a
24 damage to other people that wasn't reflected in the
25 private calculations, okay, and so when an activity

1 causes damage to other people there's a strong
2 possibility that the private decision won't be the
3 optimum decision.

4 Now, I have an overhead here which
5 reviews the steps that we might follow if we were
6 actually trying to estimate what the net social benefit
7 of land in a particular use was, and I think that these
8 steps are essentially the steps that one might follow
9 in a forest management unit.

10 To estimate the net social benefit of a
11 particular use we should include all inputs and outputs
12 regardless of who gets them or supplies them. So I've
13 said include all parties, that is, I want to include
14 all the inputs supplied by all people and all the
15 outputs received by all people.

16 I think a good place to start is with the
17 easily measured inputs and what I'm calling market
18 prices. So that's my Example No. 1 where I just had
19 marketed outputs, marketed inputs, I had a market price
20 which I could use for my corn and my potatoes and for
21 my labour and my fertilizer, and I could calculate a
22 private benefit or a net social benefit using market
23 prices which was a good starting point.

24 Now, sometimes it will be appropriate to
25 adjust this starting point for the presence of

1 unemployment, that was the example of low wages -- low
2 alternative wages that I told you about. So if
3 unemployment exists or if the alternative occupations
4 are different, then it may be appropriate to adjust
5 your starting estimate. And if external costs and
6 benefits are present, it may be appropriate to adjust
7 this starting estimate. And then after you've done
8 that, you've done your best at measuring the social
9 benefit -- net social benefit of a use, then you have
10 to turn your attention to whether or not there are some
11 unevaluated environmental goals which are altered by
12 the project that you choose.

13 So I've tried to summarize that by this
14 phrase, calculate the reduction in measured net social
15 benefit implied by achieving unevaluated environmental
16 goals. The idea I'm trying to get across here is that
17 you may be prepared to reduce your measured net social
18 benefit if it's required to achieve an environmental
19 goal which you know is important but you do not have
20 the strong information -- you don't have sufficient
21 information to put an explicit monetary value on it.

22 Madam Chair, Mr. Martel, I know that
23 these examples are getting -- multiplying examples gets
24 us all dizzy. I've completed my discussion of these
25 agricultural examples and what I want to do now is to

1 come to the thorny question of time which I referred to
2 earlier as posing a problem. So now I'm going to go
3 back to Exhibit 1695A and I'm going to the page which
4 has a circled 11 on it, it's actually the 12th page,
5 and it's headed: Example for Net Present Values.

6 Now, I'm sure that you've had discussion
7 on present discounted value and how you calculate that
8 net present value from this hearing. What I want to
9 try to emphasize is what's going on when we worry about
10 net present value, and so the example I want to look at
11 is fairly close to home.

12 I want to say, suppose we were going to
13 try to calculate the net present value of the social
14 benefits that we get when we plant trees now and it
15 costs us a thousand dollars to do it and we look after
16 the trees, let's suppose we spray them in five years
17 time at a cost of \$200, and let's suppose we're going
18 to harvest those trees 80 years from now and the net
19 revenue is \$10,000.

20 Now, by net revenue I mean the value of
21 the wood, what you can sell the wood for minus all of
22 the allotted costs -- all of the harvesting costs which
23 include the cost of cutting down the trees and
24 transporting them to wherever you were going to sell
25 them and building the roads to do that.

1 Now, the big problem is that we want to
2 subtract the costs from the benefits, but the costs
3 occur either now or five years from now and the
4 benefits occur 80 years from now. See, the real
5 problem is to find some way of comparing -- of figuring
6 out what that benefit 80 years from now is worth now.

7 Well, the way people do it - and this is
8 a universally accepted procedure - economists,
9 accountants, everybody does this, everybody calculates
10 the present value of the future benefit. I'm going to
11 assume that the interest rate is five per cent, that
12 means actually five per cent on top of the rate of
13 inflation because I'm ignoring inflation in these
14 examples.

15 The point is this, if I put \$202 in the
16 bank now and it earns five per cent interest, \$202,
17 then 80 years from now I will have \$10,000. The
18 compound interest of \$9,798 added to the principal of
19 \$202 will equal my \$10,000 worth 80 years from now.

20 So what I'm going to say is the value of
21 this harvest, this \$10,000 in present day terms, is
22 only \$202 because I could put \$202 in the bank and 80
23 years from now I would have the same value as I'm going
24 to have up here with the harvest.

25 This is why foresters hate compound

1 interest because it always shows that the present value
2 of the harvest is much smaller than it will appear 80
3 years from now.

4 So I want to emphasize that if we have
5 this kind of problem of comparing benefits 80 years
6 from now with costs that we incur now, we have to take
7 the present value of the \$10,000 benefit, which is only
8 \$202, and we are going to compare that to the costs.
9 It's of course also true that the cost of spraying five
10 years from now can be covered by putting \$157 in the
11 bank now. So we will say the present value of the
12 spraying cost is only \$157.

13 Now, the effect of this is to -- at any
14 reasonable interest rate, the effect of present value
15 calculation is to make benefits and costs in the far
16 distant future look almost invisible.

17 I'm now going to go to the overhead
18 called Social Cost/Benefit Analysis Example 4, it's the
19 next page on 1695A, and I'm going to try to include
20 these ideas of net present value in the social
21 cost/benefit analysis of the hypothetical example which
22 I gave you of planting and harvesting in 80 years.

23 When we calculate the net social benefit
24 we have to take the benefit of the timber in 80 years
25 which is \$202 of present value, we have to deduct the

1 costs of a thousand dollars which we incur right now,
2 we deduct the \$157 which is the present value of the
3 spraying cost, and the result is that the net social
4 benefit, the value of the land used for this purpose is
5 negative \$955.

6 Now, what does that mean? This is why I
7 wanted to bring up the example. How should we
8 interpret a negative net social benefit?

9 Well, if we undertake the planting
10 exercise the cost is a thousand dollars plus \$157 at
11 present value in spraying and the result that we get is
12 \$10,000 worth of benefit 80 years from now.

13 We could get the same \$10,000 benefit 80
14 years from now by investing \$202 now and we would have
15 \$955 left over and we could use that in any way we
16 wanted and, in particular, we could use it for social
17 spending.

18 In this little example the negative net
19 social benefit of the silvicultural exercise means that
20 we haven't got \$955 which we could have spent on
21 schools or housing or university education or just
22 about anything else, and what I really want to stress
23 is that this kind of computation suggests that when
24 there is a negative net present value of an option,
25 then you're giving up social opportunities.

Well, Madam Chairman, that's all of the examples which I wanted to go through. I'm now turning to the last item in my bundle, 1695B. I'm sorry, it's not the last bundle, in fact it may not be in 1695B. I'm sorry, the overhead which I have now is not in either bundle. No, it's the second page of 1695B. I'm now looking at a overhead which is called Application to Forest Management, it's the second page of Exhibit 1695B.

Now, Madam Chair and Mr. Martel, what I want to do is simply review a number of additional ideas that we should keep in mind when we're applying the concepts which I've developed to forest management.

MR. MARTEL: Could I ask a question
before you go on?

DR. MULLER: Certainly.

MR. MARTEL: Stopping before we get to this page, with what you just concluded.

DR. MULLER: Sure.

MR. MARTEL: With the negative -- what would you ever have to do in terms of the real world to get a positive net present value on that investment in terms of regeneration and so on as opposed to just investing some money?

DR. MULLER: Well, I'm not sure if I have

1 fully understood the question, but --

2 MR. MARTEL: Well, the question very
3 simply is: Do you ever end up with a positive doing
4 this sort of calculation, or what would the figures
5 have to be like to show a positive net present value?

6 DR. MULLER: Well, I think that is a very
7 good question and I think if Professor Benson were here
8 he would say what you should do is choose a technique
9 here of planting which involves a much lower cost. As
10 long as the cost of planting and spraying or the cost
11 of silviculture is less than \$202, as long as the
12 present value is less than \$202, then you will have a
13 positive net present of your planting exercise.

14 MS. SWENARCHUK: Q. Dr. Muller, in
15 response to Mr. Martel's question you said choose a
16 technique of planting which includes a lower cost.

17 DR. MULLER: A. Well, planting must be
18 interpreted very broadly there and it might reasonably
19 be -- it might be quite reasonable to use a technique
20 of harvesting which resulted in regeneration at low
21 cost.

22 So to anticipate the ideas later in the
23 testimony, of course it's quite possible then for a
24 modified cut which leads to natural regeneration to
25 show a higher net present value than artificial

1 regeneration of the kind that I've sketched out in this
2 example. And the reason is that these initial costs
3 would be very much lower in, what Professor Benson I
4 believe calls, extensive forestry.

5 So I think that that was a very critical
6 question, and that is why -- that is what's driving
7 these results. You have to -- if the benefit of the
8 future timber is very low, then you have to -- you can
9 only afford to make very small investments now and
10 still yield a positive net present value.

11 Let me just review or advance a few more
12 ideas that I think we should keep in mind. When we go
13 to apply maximizing net present value as a criterion
14 for assessing forestry management I think there are a
15 number of ideas that we have to keep in mind.

16 The first one that I have listed here is
17 the importance of multiple outputs. It's inappropriate
18 in my opinion to focus only on one possible use of the
19 forest. For example, it's inappropriate to say the
20 forest only provides timber, the forest also provides
21 the kind of ecological services that you've heard about
22 from other witnesses and it provides recreational
23 services. So the forest is an asset which provides
24 many different services to the community.

25 The second point we have to keep in mind

1 is that many of these services are not sold through
2 markets. For example, using recreational services are
3 not typically sold through markets and certainly the
4 value of the forest in maintaining biological diversity
5 is not sold through a market.

6 Well, of course, if an output is not sold
7 through a market, a private cost/benefit allocation is
8 never going to lead to anybody promoting that use. So
9 that as soon as we observe that some uses are not sold
10 through markets, we have to be aware of the possibility
11 that private decisions are not going to be socially
12 optimal.

13 A third idea that we have to be very
14 careful about is the recognition that we're dealing
15 with a long time period here and this is the net
16 present value problem which I've just gone through. We
17 have to be careful the way in which we compare inputs
18 and outputs because many of the outputs are received
19 many years from now.

20 I think we also have to be very careful
21 to remember that the forest is geographically varied
22 and that, as I said earlier in my testimony, what's
23 appropriate in one corner of the province may not be
24 appropriate in another corner, and it's also true that
25 areas of the forest may have particularly high values

1 in non-timber uses whereas other areas don't.

2 I think it's important to remember that
3 even without worrying about regenerating the forest,
4 it's quite possible that the benefits of harvesting
5 certain wood are less than the costs. So my fifth
6 point here is possible negative net present value of
7 harvest. What I'm trying to say here is that you
8 should bear in mind the possibility that the costs of
9 harvesting some wood exceed the social benefits that we
10 get from them.

11 Now, this would be particularly the case
12 of a low yield stand which was a long distance away
13 from roads so you had to build a lot of roads to get
14 into it and you don't have very good timber when you
15 come to it. If we have such timber and we discover
16 that it's got a negative net present value of
17 harvesting, then we ought not to harvest it, but the
18 calculation is telling us that other values for the
19 timber are higher.

20 I think this is important because
21 sometimes the areas that would be best for recreation
22 or best for old growth forest protection and so forth
23 may easily not have very high timber values.

24 The sixth point that we have to be
25 careful of is that it's quite possible, quite possible

1 for regeneration expenses considered as an investment
2 to have negative net present values as measured by
3 conventional easily measured inputs and outputs. This
4 is a fact of life that we have to address. We have to
5 address the fact that conventional analysis usually
6 shows that regeneration expenditures have negative net
7 present value.

24 So to summarize on that particular point,
25 it's quite reasonable to enforce regeneration if you

1 believe that the non-timber values of sustainable
2 development and production of wilderness are worth the
3 sacrifice of net present value, measured net present
4 value.

5 MR. FREIDIN: I'm just wondering whether
6 the witness could repeat that last comment, he trailed
7 off.

8 DR. MULLER: Certainly.

9 MR. FREIDIN: You were speaking about
10 reasonable to enforce regeneration if you believe that
11 non-timber goals. And then you trailed off.

12 DR. MULLER: If you believe that
13 non-timber goals are sufficiently important to offset
14 the loss in measured net present value, and I lay
15 stress on the measured because this is an example of
16 the case in which we may be willing to reduce measured
17 net national income, we might be willing to reduce
18 measured net present value in order to achieve a social
19 goal which is not easily quantified.

20 MR. FREIDIN: Thank you.

21 DR. MULLER: Now, my last few comments,
22 Madam Chair, are related again to this job issue which
23 I hope I'm not wrong in interpreting this as being
24 important to you.

25 MADAM CHAIR: You are not wrong, Dr.

1 Muller.

2 DR. MULLER: I would simply like to say
3 that I believe the job related issues are important and
4 they are legitimate, but when you're dealing with these
5 issues you should try to remember the important
6 distinction between allocative issues and distributive
7 issues.

8 So the concern for the welfare of workers
9 is important, but it's a separate question I think from
10 the issue of the most beneficial use of the
11 environmental resource.

12 MR. MARTEL: The what?

13 DR. MULLER: The most beneficial use, the
14 highest valued use.

15 MS. SWENARCHUK: Of the environment.

16 DR. MULLER: Of the environmental
17 resource. I'm sorry. Would you like me to repeat
18 that?

19 MR. COSMAN: I would, if you don't mind.

20 MR. MARTEL: You might explain it to me.

21 DR. MULLER: Okay. What I said was that
22 concern for the welfare of workers is legitimate and
23 it's important but it's separate from the issue of the
24 best use of the environmental resource.

25 And the reason I said it was that the

1 issue of the best use of the environmental resource is
2 essentially an issue of how big the pie should be, and
3 the issue of whether or not the workers are fairly
4 treated is an issue associated with who gets what slice
5 of pie. So they really are separate questions.

6 The second aspect of job related issues
7 that I want to point out is that when workers are
8 earning more in forestry occupations than they will be
9 able to earn somewhere else, that fact should be
10 incorporated in a net social benefit calculation. It's
11 quite legitimate to adjust the market prices in a way
12 which accounts for the fact that forestry workers are
13 getting something of value out of being able to work in
14 this particular industry.

15 I would also like to say that if it's
16 really the case that the environment -- if it's really
17 the case that true national income is improved by
18 emphasizing an expansion of non-timber values over and
19 allowing a reduction of timber use, if that happens to
20 be the case, then it should be possible to compensate
21 anybody who's harmed by that movement.

22 So it should be possible -- if you really
23 think that net social value is improved by a strategy
24 which reduces jobs in timber production, it should be
25 possible to compensate the people who have lost their

1 jobs by helping them move, helping them retrain, doing
2 whatever is necessary so that they are not the ones
3 that bear the burden. What I'm really advocating is
4 that, if you will, the tree huggers in the south should
5 have their taxes raised in order to compensate for the
6 people of the north who want to have jobs.

7 MR. MARTEL: Do you think they could
8 afford it?

9 DR. MULLER: Who?

10 MR. MARTEL: The people who are willing
11 to pay taxes for job losses in the north in terms of
12 retraining, relocation. I mean, we're looking at very
13 large amounts of money when you start that; aren't you?

14 DR. MULLER: Okay. Well, let me address
15 that very important question in several ways.

16 First of all, it's an empirical question
17 of how many jobs are at stake, and it may -- I'm not
18 admitting that large numbers are, that's an empirical
19 question which we haven't addressed at this stage in
20 our testimony.

21 Secondly, if people in the south were not
22 willing to compensate fully, then that would be
23 evidence that the net social value, net social benefit
24 of moving the land out of forestry and into
25 environmental services was less than the net social

1 benefit of leaving it in forestry. In other words, in
2 other words, if the people in the south aren't willing
3 to pay the bill, so to speak, then it's not worth
4 doing.

5 MR. MARTEL: How do you get the real
6 handle on that then?

7 DR. MULLER: How do I get a real handle?
8 Well, that's a third point.

9 Surveys of willingness to pay for what
10 you might call non-participatory environmental benefits
11 often yield amazingly high numbers; that is, if you ask
12 people in southern Ontario: How much are you willing
13 to let your taxes go up in order to maintain all of
14 northern Ontario's old growth forest - I'm not saying
15 we should - I bet you would find quite a few people
16 saying they'd be willing to pay \$30 a year, and if you
17 multiply \$30 a year by 6-million people in southern
18 Ontario, you've got quite a bit of money.

19 Now, the moral I'm trying to draw here is
20 that this value which I've just referred to which might
21 be called an existence value, if it really is as
22 prevalent as people say it is, then it ought to be
23 possible to slightly raise taxes in the south to
24 compensate for the costs of achieving the environmental
25 values that we want to have in the north.

1 If we can't do that, if people in the
2 south are not willing to spend more than a dime a
3 piece, and that's not enough to cover all these costs
4 which you postulate, well then, by definition it's not
5 worth doing. And a social cost/benefit analysis is
6 supposed to be trying to find out whether that's --
7 which is the actual case.

8 MS. SWENARCHUK: Q. Dr. Muller, can I
9 just interrupt for one moment.

10 DR. MULLER: A. Yes.

11 Q. Dr. Morrison, do you have any
12 comments on this cost question? I know you'll be
13 addressing costs currently being paid for forest
14 management overall later on in your testimony.

15 Perhaps you can just help Mr. Martel with
16 some of that information at this point. Did you want
17 to refer to one of your exhibits for that purpose?

18 DR. MORRISON: A. Yes.

19 Q. All right.

20 MS. SWENARCHUK: What I suggest then is
21 that we take the break now, which is the usual time,
22 and I think Dr. Morrison will probably be starting soon
23 after the break in any event and perhaps he could
24 address that point first.

25 DR. MULLER: If I could just say, Madam

1 Chair, that this completes what I have to say at this
2 point in our testimony and I will be coming back to
3 discuss the details of that social cost/benefit
4 analysis, but I had intended to turn it over to Peter.

5 MADAM CHAIR: All right. Thank you, Dr.
6 Muller.

7 The Board will be back in 20 minutes.

8 ---Recess at 2:45 p.m.

9 ---On resuming at 3:05 p.m.

10 MADAM CHAIR: Please be seated.

11 MS. SWENARCHUK: Q. I believe Dr. Muller
12 has a couple of additional comments before Dr. Morrison
13 starts and they are related to the job issues.

14 DR. MULLER: A. Yes. Madam Chair and
15 Mr. Martel, I completely forgot one extra point I
16 wanted to make under this general heading of job
17 related issues.

18 That point is that there is a tendency --
19 in my judgment, there is a tendency to exaggerate how
20 many jobs are actually dependent on the forest industry
21 in Ontario, and I note that this is particularly
22 evident in discussions of employment such as you see in
23 witness statement 5 from the Ministry of Natural
24 Resources. I have in my notes pages 64 and 65 and in
25 the executive summary Item No. 11.

1 And in this kind of statement that is
2 exemplified by witness statement No. 5 from MNR, you
3 find people presenting the total employment dependent
4 on an industry, shall we say the forest industry, and
5 they will say there are so many jobs directly and
6 indirectly dependent on the industry, and sometimes
7 they will even say there are so many jobs dependent --
8 directly, indirectly and in an induced way.

9 The witness statement which I've just
10 cited on pages 64 and 65, that is MNR witness statement
11 No. 5, reports that - I forget the exact number - but
12 there are 1.8 to somewhat more jobs directly and
13 indirectly dependent on the forest industry per
14 individual job that is there.

15 And what I wanted to say was that these
16 estimates are usually based on what's called
17 input/output analysis and it's the opinion of most
18 practitioners of cost/benefit analysis that
19 input/output analysis should be used very carefully in
20 the context of cost/benefit analysis, and the reason is
21 that the model behind these estimates that so many jobs
22 depend indirectly on forestry jobs, that model
23 effectively assumes that all of the jobs that you count
24 as being part of the forest industry are net increases
25 in employment.

6 I would summarize that by saying it's
7 assumed that the gross increase in employment isn't
8 reduced by removing jobs from anywhere else in the
9 economy, it's assumed that we're not crowding out
10 employment somewhere else.

11 Now, many authorities on cost/benefit
12 analysis warn against uncritical use of multipliers
13 such as this, and I make reference in particular to the
14 Treasury Board Guidelines on benefit/cost analysis
15 which I will talk to you about in a little bit more
16 detail tomorrow.

17 Also our answer to the CASIT
18 Interrogatory No. 11 and pages 72 through 77 of our
19 witness statement have comments about the difficulties
20 associated with using input/output based estimates to
21 estimate employment.

22 So at this stage in our testimony I
23 really simply wanted to indicate that while the concern
24 for job related issues is entirely legitimate and while
25 there are ways of adjusting cost/benefit analyses to

1 take into account the fact that people are having a
2 hard time finding other jobs, the actual question of
3 how many jobs are critically dependent on the forest
4 industry is one over which there can be some dispute
5 and the use of input/output based multipliers does not
6 receive encouragement in a number of cost/benefit
7 authorities.

8 I should also point out that I do not
9 believe that it's our position; that is, I don't
10 believe that Dr. Morrison or I, believe that we are
11 talking about alternatives which involve wiping out the
12 forest industry, the timber industry in northern
13 Ontario.

14 I think we both view ourselves as helping
15 the Board decide on alternative ways of carrying out
16 the Industry which might involve some adjustments up or
17 down at various times in timber production, and also
18 give better attention to the environmental problems
19 that timber management sometimes causes.

20 So that I think it would be a mistake to
21 focus excessive attention on estimates of how many jobs
22 are directly and indirectly dependent on the forest
23 industry as such in northern Ontario.

24 MR. MARTEL: Is there any consistency in
25 deriving those figures, because if you're talking about

1 mining then someone will say: Well, it's one to one
2 and a half jobs in mining and with someone else it's a
3 different ratio of direct jobs and those related to it.
4 It seems that the figure floats around, but...

5 DR. MULLER: I think there's a consistent
6 methodology behind it. Basicaly what you say is, if
7 you spend \$10,000 on forestry outputs, let's say lumber
8 outputs, you need a fixed number of people to be
9 employed in the sawmills which produce that, and that's
10 a number which you can come up with fairly quickly, or
11 at least all you really do is you take readily
12 available data on payments to labour as a fraction of
13 total output in forest industry and you say: Well, we
14 can use this data to directly tell us how many jobs are
15 associated with \$10,000 worth of output in sawmills.
16 That's what is called the direct formula.

17 Then, because sawmills require sawlogs
18 you can also say: Well, jobs are indirectly required
19 in the logging industry in order to supply the sawlogs.
20 And there's a technique of economic analysis called
21 input/output analysis which allows you to compute,
22 under simplified assumptions, how many additional
23 indirect jobs are required to produce the sawlogs which
24 are then going to be used in the sawmill.

25 There's a third category of job called

1 induced jobs, where you take into account the fact that
2 money earned in the sawmill industry is spent and that
3 that generates employment elsewhere in the community.

4 Peoples' estimates of direct and indirect
5 benefits -- I'm sorry, direct and indirect employment
6 requirements probably differs somewhat in the numbers
7 like 1.8 or 1.7 because it is true that different jobs
8 require different proportions of labour to other
9 materials.

10 So \$10,000 of expenditure on one job may
11 not equal the same number of direct jobs as the case in
12 another industry, and it's also true that one industry
13 like sawmilling may require more labour intensive
14 inputs than some other industry does.

15 So I think it's legitimate that you use
16 this input/output methodology to find different
17 estimates of direct and indirect requirements. It's a
18 consistent methodology.

19 There are some really problems with it
20 though and one of the most important problems is with
21 induced employment. Really the point is that if you
22 think, for example, of creating jobs in the north by
23 subsidizing silvicultural investment, suppose we're
24 spending a hundred million dollars on silvicultural
25 investment, that certainly creates a bunch of jobs both

1 direct and indirect and induced, but any expenditure of
2 a hundred million dollars would also have created
3 direct, indirect and induced jobs.

4 So it's important to take into account
5 the fact that this train of created jobs would also
6 have been created by an alternative use of the same
7 government funds.

8 Madam Chair, that's all I have to say at
9 this time.

10 MADAM CHAIR: Thank you, Dr. Muller.

11 MS. SWENARCHUK: One second, Madam Chair.

12 Now, Madam Chair, I have provided a
13 number of documents to you that relate to Dr.
14 Morrison's evidence.

15 I have a typed exhibit list. This
16 morning we reserved Exhibit No. 1696 for the copies of
17 overheads, which is this package. (handed)

18 The next document that Dr. Morrison will
19 refer to is the FIFA Newsletter, Forest Economics and
20 Policy Analysis Research Unit Newsletter. So I propose
21 that we give that Exhibit No. 1698.

22 And then the Globe & Mail excerpt,
23 Newsprint Recycling Projects, 1699. It should be in
24 the package I gave you.

25 MADAM CHAIR: The newspaper article is

1 Exhibit 1699.

2 MS. SWENARCHUK: And that then would make
3 the next document, which is an excerpt from the
4 Ministry of Industry, Trade and Technology, Industrial
5 Restructuring Commissioner Report entitled: Review of
6 Ontario's Forest Management Expenditures and Revenues.
7 That's a six-page excerpt. That would make that one
8 Exhibit 1700.

9 MADAM CHAIR: For the record, Ms.
10 Swenarchuk, do you want to read in a description of the
11 exhibits very quickly for the court reporter.

12 MS. SWENARCHUK: 1696 comprises the hard
13 copies of overheads to be used by Dr. Morrison.

14 1697 we numbered this morning.

15 1698 is a Newsletter by the Forest
16 Economics and Policy Analysis Research Unit, Volume 6,
17 No. 1, December, 1990, and it's an eight-page excerpt.

18 ---EXHIBIT NO. 1698: Newsletter by Forest Economics
19 and Policy Analysis Research Unit
 Volume 6, No. 1, December, 1990.

20 MS. SWENARCHUK: Exhibit 1699 is a
21 reproduction of an article from the Globe & Mail of
22 December 18, 1990 entitled: Newsprint Recycling
23 Projects Unveiled. It's a one-page document.

24

25

---EXHIBIT NO. 1699: One-page reproduction of article from *Globe & Mail* of December 18, 1990 entitled: *Newspaper Recycling Projects Unveiled.*

MS. SWENARCHUK: Exhibit 1700 is a six-page excerpt from a report entitled: Review of Ontario's Forest Management Expenditures and Revenues, produced by the Industrial Restructuring Commissioner for the Ontario Ministry of Industry, Trade and Technology.

---EXHIBIT NO. 1700: Six-page excerpt from report entitled: Review of Ontario's Forest Management Expenditures and Revenues, produced by Industrial Restructuring Commissioner for the Ontario Ministry of Industry, Trade and Technology.

MS. SWENARCHUK: Q. Go ahead, Dr.

DR. MORRISON: A. Madam Chair, Mr. Martel, what I would like to do this afternoon is continue where my colleague left off and talk about the specific component of timber management activities in Ontario.

I expect, given the time, that I won't get very far through those, but what I'll be doing after I review those activities individually is then be talking about some of the provincial forestry issues.

1 and from there Dr. Muller and I will be continuing with
2 a brief assessment of the Environmental Assessment
3 Document.

4 The timber management activities in
5 Ontario can be broken down into the following classes.

6 An activity which is fundamental, which
7 is allocating land, and this may be an allocation to
8 industrial forestry purposes or it may be an allocation
9 to other purposes.

10 The next activity is development of
11 access to that land if it is to be used for timber
12 production.

13 The third is to cut that timber.

14 Fourth we have regeneration of the trees
15 through whatever means.

16 Fifth, stand tending may take place as
17 part of the suite of timber management activities.

18 And finally there is protection from
19 insect and fire that may be required.

20 It's really only for the purposes of
21 description and discussion that I'm separating out the
22 activities in this way.

23 The fundamental point that I would like
24 to make to begin with is that these activities are all
25 linked and that what you do at one step in this

1 sequence will influence the consequences in another,
2 and as I will be arguing later, you may want -- you may
3 choose to link activities, for example, the way that
4 you cut timber will influence the way that trees
5 regenerate; the way that you cut timber may influence
6 the extent and the amount of protection that is
7 required.

8 To begin with the first activity then,
9 land allocation, there are three basic steps to
10 approaching that fundamental problem.

11 First is to assign a value to the land in
12 the way that my colleague has described, including the
13 second step, a consideration of all values; third, you
14 then compare the alternatives, and as we have argued,
15 you compare those alternatives on the basis of net
16 present value or net social benefit.

17 Assigning a value to the land is
18 essential because, as we will argue, if that land has a
19 negative value for the purpose for which you intend it,
20 then you ought not to have -- you ought not to allocate
21 the land to that purpose.

22 I would like to draw your attention to
23 the figure from the Class Environmental Assessment
24 Document which indicates that timber management, as an
25 activity, is assumed to be taking place over that

1 entire area. This is implicitly an allocation of that
2 part of the Province of Ontario to timber management
3 yet, to my knowledge, no analysis has been done to see
4 whether that is appropriate or not.

5 Land allocation may be an irreversible
6 process. If you allocate land to some purposes, it may
7 completely preclude other uses. The best example is
8 probably allocating land to agricultural or to forestry
9 which precludes the use of that land for wilderness
10 recreation purposes. Because of that irreversibility,
11 one ought to be very careful, I would argue, in making
12 such a decision.

13 There are a number of tools available for
14 helping make land allocation decisions. One is to
15 identify what's known as the extensive margin. This is
16 described in the witness statement, but I would like to
17 give you a figure to illustrate how it might be
18 estimated.

19 On the "x" axis here we have --

20 Q. For the purposes of the record we're
21 now examining page 4 of Dr. Morrison's overheads.

22 A. Thank you. Along the "x" axis here
23 we have the distance from the mill for which timber
24 might be to which timber might go, along the "y" axis
25 we have value or dollars per cubic metre.

1 The cost of harvesting and transport to
2 the mill will obviously increase as you move further
3 away from the mill, so that is what this line is here.

4 The price that one could obtain for the
5 timber is, of course, going to be unchanged as you move
6 further from the mill for the same stand located at
7 different distances.

8 Where those two lines intersect is the
9 point at which the price that you get for the timber
10 exactly equals the cost of harvesting and transporting
11 to the mill, and it's that point there which can be
12 identified as a specific distance, which is the
13 extensive margin.

14 And it's at that point that a logging
15 operator -- beyond that point, a logging operator ought
16 not to go in terms of harvesting within a forest
17 management unit.

18 If, however, there is a subsidy of some
19 kind, whether it be in terms of harvesting cost or
20 reduced transportation costs or a road building
21 subsidy, then that extensive margin will shift outward
22 and the extensive margin will in fact be further from
23 the mill.

24 As I'll be arguing later, there in fact
25 appears to be such a subsidy in Ontario provided by

1 provincial government to the forest industry which has
2 the net effect of leading to harvesting beyond the
3 socially optimal point.

4 The extensive margin may be used in terms
5 of setting boundaries on the areas in which a
6 particular activity may be carried out, such as timber
7 harvesting.

8 The next economic concept I would like to
9 explain briefly - this is the next figure in my set of
10 overheads - is the concept of an intensive margin.

11 Now, this is more difficult to locate on
12 a map because what it relates to is the extent, the
13 amount of capital and labour or other inputs that might
14 be applied to a given piece of land in order to produce
15 a given set of outputs.

16 Now, what we have in this figure then is
17 along the "x" axis the amount of fertilizer per hectare
18 and along the "y" axis the dollars per hectare, and
19 what I'm doing in this case, for the purposes of
20 illustration, is assuming that the increased inputs
21 that could take the form of capital or labour are
22 captured by the amount of fertilizer. You could use
23 labour in there and there would be no change except for
24 that particular item in the figure.

25 So obviously what we have, to begin with,

1 is that the cost of fertilizer is going to increase as
2 the amount increases. An obvious statement. What
3 makes this figure a little bit more interesting and
4 more useful to forest managers is the relationship of
5 the value of the wood to the amount of fertilizer
6 applied.

7 So if the value of the wood increases,
8 presumably as you get better growth, more rapid growth
9 and perhaps a higher quality tree, up to a certain
10 point, and then at some point it's going to start to
11 level off or in fact may drop off with excessive
12 applications of fertilizer.

13 What we can do in this situation is to
14 identify the so-called intensive margin which
15 represents the biggest gain, the biggest differential
16 between the value of wood and the cost of fertilizer
17 that we might apply. And it's that intensive margin
18 which can be translated -- you can extend it down and
19 determine the amount of fertilizer that might be
20 appropriate to apply. That would help us determine the
21 level of management, the intensity of management that's
22 appropriate for a given piece of land.

23 That same concept could be extended to
24 any of the other inputs. So we could extend it, for
25 example, to the amount of capital that is applied in

1 terms of treating or applied to silviculture or applied
2 to an intensive management program on a given piece of
3 land.

4 By examining this intensive margin we can
5 make a more appropriate judgment about how to allocate
6 lands to various intensities of use. What I've just
7 shown you are two of the very basic ways in which you
8 can start to make judgment -- economic judgment about
9 the way that land ought to be managed, which land ought
10 to be managed for which purposes.

11 As an example of this, of the need to do
12 this kind of -- to make this kind of a determination,
13 I'm going to present this table which is the next in
14 the set of my overheads and the figure that follows it
15 which are taken from a paper prepared by two MNR
16 foresters, I believe working in the northeastern region
17 of the province, and they have classified the land in
18 their region into their potential for forest management
19 and the potential is based on the productivity of the
20 land.

21 And you can see here that what they term
22 the elite land, which occupies a relatively small
23 proportion of the total land area, has a very high
24 growth rate and might well be suitable for an intensive
25 management approach.

1 The bulk of the land in the region has a
2 lower growth rate and a specific determination of how
3 that land ought to be managed and how that land ought
4 to be allocated could be based in part on this
5 consideration.

6 The next figure in the overheads shows
7 the distribution of those land classes and there's a
8 couple of points that I want to make from this.

9 One is that the high quality land, the
10 so-called elite land, which is the most productive, is
11 scattered -- well probably not randomly, but is widely
12 scattered throughout the region.

13 Second of all, that there is -- as you go
14 from one point to another, there is a high variability
15 which means that the way that you manage the land needs
16 to be site-specific and it needs to take into account
17 the local ecological factors and the local economic
18 concerns and the local economic factors in the region.

19 So what I've done so far is describe, and
20 what my colleague has done as well, is describe what we
21 believe to be the ideal method of determining how land
22 ought to be allocated, whether it be to timber
23 production or some other means.

24 What I would like to do now is just to
25 read you a brief quote from the Timber Management

1 Planning Manual for Crown Lands in Ontario, and this is
2 from page 11 of the April, 1987 update Section 2.4.7.1,
3 Determination of Allocation Criteria:

4 "Allocation for depletion is based on
5 considerations such as age, quality,
6 proximity to access or the need for
7 salvage. Allocation for renewal is based
8 on management strategies, the possibility
9 of natural regeneration, site protection
10 et cetera. Allocation for maintenance is
11 based on the values to be protected. The
12 expected return on investment should be
13 considered for all renewal and
14 maintenance operations."

15 A couple of comments I would like to make
16 about that. First of all, that in terms of the
17 allocation for depletion, which is supposedly based on
18 considerations such as age, quality, proximity to
19 access and the need for salvage, there is no indication
20 of how those factors ought to be weighed, which ought
21 to take priority; there is no indication of whether the
22 null alternative ought to be considered, which is
23 considering an alternative to allocation for timber
24 production.

25 And despite the last statement in that

1 paragraph which I've read, which is related to the
2 expected return on investment, there appears to be, to
3 my knowledge, in the timber management planning process
4 no consideration of the net present value of land in
5 terms of its allocation to that potential use.

6 Now, this is of concern because it means
7 that if we're not properly assessing the net present
8 value; that is, if we're not properly including some of
9 the non-timber values, we're perhaps including them
10 only as constraints or in the way that they may have an
11 impact on other MNR programs, then it means that we may
12 be doing timber harvesting in the wrong places in the
13 province or at the wrong times, it means that we're not
14 maximizing the social benefits that we could be getting
15 from timber production from the forest.

16 This same problem with allocation of
17 forested land shows up in the way that reserves are
18 handled. Again, there is no procedure in place to my
19 knowledge to evaluate the net benefits of establishing
20 a reserve and this is exacerbated by the problem that,
21 in many cases, we don't understand the effects of
22 establishing a reserve, we don't understand the effects
23 of timber management and, hence, we may have a poor
24 understanding of the rationale for those.

25 So to conclude with respect to land

1 allocation, the steps which I indicated ought to be
2 taken in terms of making a land allocation which would
3 maximize our social benefits, none of these appear to
4 be taken in the present Ontario Ministry of Natural
5 Resources approach. We are not assigning a net value
6 to the land, all values are not being considered, and
7 there is no comparison of the alternatives, especially
8 with respect to the null alternative.

9 To move on then to the next activity,
10 development of access to an area. The kinds of
11 questions that we ought to be asking in terms of
12 deciding whether an area ought to be accessed or not,
13 and accessed specifically for obtaining access to the
14 timber for purposes of cutting it, is that there ought
15 to be an analysis, first of all, in the simplest
16 analysis: Does the value of the timber in that new cut
17 block, is that going to exceed the private cost, the
18 costs of building this road, both primary or secondary
19 road plus necessary tertiary roads?

20 So that is the first question we ought to
21 be asking, that's the question that the Industry, who
22 is interested in cutting this and obtaining the timber
23 from that cut block, ought to be asking.

24 The second question we ought to be
25 asking, which is a slightly more complex question but

not a lot more, is: Does the value of the timber that might be obtained from that cut block exceed the private and government costs combined? So if the government has invested money in terms of contributing to the road construction costs or has contributed in some other way, then those ought to be included, and that is approaching a net social benefit analysis.

Finally, the more -- the most sophisticated question that we could ask in this particular context is whether the value of the timber exceeds the social cost, and at this point we would be bringing in the impacts on the other non-timber values and we would be including impacts on other resource users or potential resource users of that cut block.

So that then is the set of questions that we ought to be considering in terms of making access judgment.

The Ministry of Natural Resources covers some of the road building costs for the Industry and, as a result, they are in effect providing a road building subsidy. The consequence of this, as I indicated earlier, is that we are in fact harvesting beyond the extensive margin, we are harvesting perhaps in areas that we ought not to be harvesting in.

With respect to the specific

1 decision-making approach which the Ministry apparently
2 uses for making judgment about whether and where roads
3 ought to be constructed. And I'm referring now to
4 Exhibit 1029 which I gather is the most recent
5 statement of their approach to assessing whether roads
6 ought to be constructed and evaluation of the
7 alternatives, there's a number of comments that I would
8 like to make about this.

9 First of all, that the null alternative,
10 that is the alternative of not building a road is not
11 evaluated. Second of all, there appears to be no
12 assessment of the values, specifically the monetary
13 benefits that might be obtained by building the road.

14 And that's reflected in the way that
15 effectiveness in that document -- in that exhibit is
16 defined. And cost effectiveness in Exhibit 1029 is
17 really cost effectiveness which makes the assumption
18 that you're going to be harvesting an area and it
19 becomes a question then of: What's the most cost
20 effective way of getting access to that area, rather
21 than asking the question about: Should that area be
22 accessed at all.

23 Then finally, there appears to be in the
24 document no weighting of the relative values of
25 non-timber versus timber values, or non-timber versus

1 non-timber values, and this reflects the lack of
2 economic analysis of those non-timber values by the
3 Ministry.

4 So to conclude then, based on the
5 material that I've reviewed and based on the evidence
6 that I've seen of the Ministry's road planning process,
7 there is no consideration of the net value of those
8 roads, the net present value is not being assessed,
9 because of the subsidy which exists it's likely that we
10 are building roads and harvesting beyond the extensive
11 margin in areas where there is in fact a net social
12 cost to harvesting.

13 Just to conclude, I would like to refer
14 to Exhibit 781, which is a letter to Don Huff from J.
15 D. Murray who's the acting District Manager for
16 Carleton Place District and it's dated June 29th, 1987,
17 and I would like to draw your attention to the third
18 line on page 2 where it states that:

19 "No economic justification for any of the
20 options were presented at this point in
21 time."

22 It goes on to say:

23 "Should the planning team decide on an
24 option, this type of justification could
25 be done."

1 That I would argue is putting the cart
2 before the horse or, in this case, the road before the
3 justification.

4 "However, if you wish to perform a basic
5 cost analysis on the options, the best
6 analysis is the longer the road the more
7 it costs."

8 MR. MARTEL: A very sophisticated
9 statement.

10 DR. MORRISON: Hopefully true, hopefully
11 true. Hopefully there is some evidence to back it up.

12 MS. SWENARCHUK: Q. Dr. Morrison, what's
13 your opinion of that approach to economic analysis of
14 road building?

15 DR. MORRISON: A. Flawed. As I've
16 indicated, I think that one needs to analyse carefully
17 whether you want to be building a road to an area
18 before you actually build it. Common sense would
19 indicate that is the way you ought to proceed.

20 At this point I was going to switch to
21 talk about timber harvesting, and I note that there are
22 three minutes left until four o'clock. How would you
23 like to proceed?

24 MADAM CHAIR: We will stop for now, Dr.
25 Morrison. Thank you. We will pick it up at nine

1 o'clock tomorrow morning. Thank you, Dr. Muller.

2 W; 're going to have a procedural
3 discussion now and you're invited to stay if you want,
4 but you're finished for the day.

5 MADAM CHAIR: Mr. Hanna?

6 MR. HANNA: Madam Chair, perhaps before
7 the witnesses retire, there's two issues I'd ask you if
8 I could get clarification from Ms. Swenarchuk through
9 you on.

10 First, how long she expects the witnesses
11 to be in evidence-in-chief? The second matter, as I
12 believe Dr. Muller had indicated he may not be
13 available on Wednesday afternoons due to commitments at
14 the university and I'd like to see if we were sitting
15 Wednesday afternoon?

16 MADAM CHAIR: Thank you, Mr. Hanna.

17 MS. SWENARCHUK: We expect to be two days
18 in-chief and for this week Dr. Muller is able to be
19 here for Wednesday afternoon.

20 MR. HANNA: Thank you.

21 MADAM CHAIR: Dr. Muller, you will be
22 here Wednesday afternoon?

23 DR. MULLER: Yes.

24 MADAM CHAIR: All right.

25 DR. MULLER: I thought it would be best

1 to try to get through the bulk of the materials, but I
2 will ask -- if we are still going next Wednesday I'm
3 going to ask to be excused.

4 MADAM CHAIR: All right, fine.

5 And, Mr. Hanna, that looks like you'll
6 be -- if you're cross-examining, you would be starting
7 Wednesday morning.

8 MR. HANNA: Yes, Madam Chair.

9 MADAM CHAIR: Thank you.

10 ---Panel withdraws

11 MS. SWENARCHUK: As usual this is an
12 estimate, I'm estimating that we'll finish at the end
13 of tomorrow. There could be a little bit more overlap.

14 MADAM CHAIR: We will start the scoping
15 discussion in about five minutes.

16 ---Short recess

17 MADAM CHAIR: Mr. Lindgren, for Panel 9,
18 for Dr. Bendell and Mr. Suffling and Middleton, we had
19 a short list of questions that we'd like them to
20 address their evidence to.

21 And the first one deals with comments on
22 pages 16 and 19, and this is the analyses of the
23 featured species approach in the Gogama District, and
24 we would like to have some explanation about their
25 conclusions with respect to the wildlife habitat

1 provided for by the pine plantation.

2 And our reading of their conclusion is
3 that planting jack pine is the best wildlife management
4 technique you could find, but we don't understand in
5 this discussion how old that plantation is.

6 And again, we were confused by their
7 conclusions on page 19 because if they're suggesting
8 that pine provides the best wildlife habitat, and
9 that's because it's at an early successional stage
10 because it's a plantation, then it looks as though a
11 featured species approach based on moose would be very
12 practical. So we would like to know what that
13 conclusion means.

14 Again, with respect to Table 2 on page
15 18, the conclusion that we draw from this table is that
16 shrub provides the least hospitable or attractive
17 wildlife habitat, and we can't recall that we received
18 very much evidence about shrub being habitat for
19 wildlife.

20 And we wonder if you can draw the
21 conclusion because shrub provides not very much habitat
22 that in fact spraying shrubs with herbicides is
23 something that you could do without too much concern
24 for wildlife.

25 Also, we wondered if - I think this is

1 Dr. Bendell's piece of the evidence - we wondered if he
2 could, although it isn't in his evidence directly, if
3 he had any comment to make with respect to the mobility
4 of wildlife during timber management operations.

5 The evidence we have before us of course
6 is that wildlife in many if not most cases is mobile,
7 and we wondered if he was able to add any information
8 for the Board.

9 Our next comment has to do with the
10 discussion on page 29. We would like clarification of
11 where the figure of 2.2 per cent of Ontario's land base
12 that is described as being free from logging, mining
13 and sports hunting comes, we would like to know the
14 source of that figure and what it includes exactly.

15 Our understanding is that it's 2.2 per
16 cent of park land, but we would like to know where the
17 figure came from, and if it's including all areas of
18 the province that are not logged, mined or in which
19 sports hunting takes place. It's not clear to us
20 exactly what that figure is.

21 Also, on page 29 there's a discussion of
22 areas of natural and scientific interest as possibly
23 supplementing the provincial park system, and the Board
24 was interested in knowing whether the authors were
25 regarding ANSIs as providing benefits for wildlife or

1 for other types of resources, other inanimate resources
2 and we think of Mr. Maser's comments to the effect that
3 you have to manage in some way even those areas you
4 don't intend to use for forestry or some other
5 commercial purpose.

6 And we wanted to know if it was in these
7 authors' opinions that ANSIs in fact nothing would ever
8 be done, that they would be the kinds of natural areas
9 that Mr. Maser referred to.

10 On page 39 the Board had a little trouble
11 with the idea of calling areas landscape unit type 3B
12 instead of old growth or clearcut. On the surface of
13 it we think that's sort of not a very helpful idea to
14 the public, and it's not clear to us that they would
15 want to give everything a very unambiguous name such as
16 that, but certainly the Board finds that a sort of
17 silly proposition, that you wouldn't call old growth
18 old growth or a cut-over a cut-over.

19 And we question what's meant in the
20 second sentence of that first paragraph:

21 "It thus becomes possible to make
22 explicit goals for landscape management
23 and to monitor whether these goals are
24 being achieved."

25 It doesn't make any difference I don't

1 think on what you call the areas. So we weren't quite
2 clear what they meant by making explicit goals possible
3 in this context.

4 And those are the Board's questions with
5 respect to this panel, Mr. Lindgren.

6 MR. LINDGREN: Thank you.

7 MADAM CHAIR: Did you have any questions
8 of the parties?

9 MR. LINDGREN: I had one of Mr. Cassidy,
10 who I understand will be appearing on behalf of the
11 Industry in the wildlife panel, and I see that he's
12 present today, and it relates to Item No. 2(g) in his
13 statement of issues, and he indicates that he wants to
14 cross-examine the witnesses on the significance of the
15 design purpose of the moose habitat guidelines.

16 And quite frankly, Madam Chair, I have no
17 idea what that means, and perhaps Mr. Cassidy can
18 advise me.

19 MR. CASSIDY: Throughout the witness
20 statements, in parts of the witness statements there is
21 reference to what the purpose of the moose guidelines
22 was for and what they were designed for, and I just
23 want to cross-examine on the witnesses' understanding
24 of the significance of their purpose to current and
25 future management planning.

1 MADAM CHAIR: Well, the witnesses
2 certainly address that with respect to the moose
3 habitat guidelines representing featured species
4 management.

5 What did you want to ask them beyond
6 that?

7 MR. CASSIDY: Well, as often things get
8 designed with one purpose in mind but become useful or
9 not useful for other purposes, and I'm questioning
10 about the significance of focussing on the purpose of
11 the guidelines as opposed to what their effect is.

12 MADAM CHAIR: Well --

13 MR. LINDGREN: That helps a bit, Madam
14 Chair. Perhaps I was thrown off by the word of design
15 purpose, I'm not sure what was meant by that.

16 MR. CASSIDY: I meant that in the context
17 of what the purpose of their original design was as
18 opposed to what they are actually doing, and I want to
19 focus on whether or not there is any significance to
20 that difference and if it's more significant to focus
21 on what they're doing as opposed to what they were
22 originally designed for.

23 MADAM CHAIR: Well, if the witnesses have
24 anything to say beyond how they see them being
25 implemented as a featured species approach, I suppose

1 they can do that. And if they don't have any better
2 understanding of the guidelines beyond that, then you
3 won't get an answer to your question.

4 MR. CASSIDY: Well, I'll have to wait and
5 see what they say.

6 MR. LINDGREN: And I had two questions
7 with respect to the OFAH statement of issues. The
8 first relates to paragraph sub 8 under the heading
9 paragraphs 9 to 15 and this was found on page 1 of the
10 statement of issues.

11 And Mr. Hanna has advised that he will be
12 cross-examining or may be cross-examining the witnesses
13 on the compatibility with the proposed approaches of
14 previous FFT witnesses and those of other panels.

15 And that, Madam Chair, does not provide
16 us with much guidance because we are confused as to
17 which approaches of previous FFT witness and others are
18 being referred to here.

19 This gives us little or no direction in
20 terms of the evidence that should be led to address
21 this concern. Perhaps Mr. Hanna can advise me what he
22 refers to here.

23 MR. HANNA: Yes, Madam Chair. The
24 previous witnesses by other parties referred of course
25 to Ministry of Natural Resources speaking about

1 featured species, but also speaking about the special
2 provisions for dealing with endangered, rare species
3 and also locally important species. That's as far as
4 the Ministry go, what I'm referring to there, and the
5 concept of guidelines and how guidelines fit into that
6 whole exercise.

7 In terms of previous FFT witnesses I was
8 referring specifically to Mr. Bendell's evidence in
9 terms of the wide sieve approach that he referred to in
10 his evidence.

11 MR. LINDGREN: You mean Mr. Benson?

12 MR. HANNA: Sorry, if I misspoke myself,
13 I meant Mr. Benson. In terms of the wide sieve
14 approach and also in the FFT terms and conditions. We
15 haven't heard evidence yet on the proposal in the terms
16 and conditions regarding the long list of guidelines
17 that are proposed to be developed in addition to what
18 is currently in place, and I am interested in seeing
19 how the evidence that is being led is compatible with
20 that development.

21 MR. LINDGREN: The second question that I
22 have, Madam Chair, relates to a statement on page 2
23 under the heading paragraph 16 to 19, and we see under
24 subparagraph 13 an indication that Mr. Hanna intends to
25 cross-examine on the role of socio-economic factors in

1 developing prescriptions using the proposed approach.

2 And I'm implemented sure Mr. Hanna is
3 aware that these witness on the wildlife panel are not
4 social scientists and they are not economists, so I'm
5 somewhat confused as to what he intends to
6 cross-examine them on in the socio-economic context.

14 One of the issues I see with the
15 approaches being put forward by FFT is how the - I
16 believe Mr. Benson's words were, net present worth, and
17 we've heard witnesses in this panel speak about net
18 present value - how those criteria interface with
19 setting objectives, for example, landscape ecosystem
20 management or that type of thing, how you use that
21 approach and interface with the socio-economic type of
22 tools we've heard evidence about today and we've heard
23 evidence about in the past, not how should we go about
24 socio-economic assessment, but what role they play in
25 terms of the types of management approach that this

1 panel is bringing forward.

2 MR. LINDGREN: Well, Madam Chair, I would
3 simply point out that that issue or those issues have
4 been addressed at some length by FFT Panels 4, 5 and 7
5 and I would suggest that if Mr. Hanna intends to
6 cross-examine on those broad issues, those are the
7 times to do it.

8 Our witnesses in Panel 9 will probably
9 have little or nothing to say on the issue of
10 socio-economic impact analysis. That's not why they
11 are being called and they're certainly not going to be
12 qualified to give opinions on those subjects.

13 MR. HANNA: Well, Madam Chair, obviously
14 this is one that's going to rest somewhat on the
15 specific question, but I have to disagree strongly with
16 my friend on that particular matter.

17 I think it's incumbent on anyone involved
18 in timber management to be able to at least understand
19 how their expertise interfaces with the others
20 expertise, not in terms of understanding all of the
21 nuances of what the appropriate social discount rate
22 should be when we're looking at silvicultural
23 investments, that would clearly be an inappropriate
24 question to ask a wildlife biologist, but to ask a
25 wildlife biologist how he sees his management approach

1 interfacing with a socio-economic expert who's coming
2 forward and saying we use net present worth or net
3 present value as the overriding criteria to decide on
4 silvicultural prescriptions, clearly the wildlife
5 biologist has to have some response to that.

6 And it's that interface that I'm
7 referring to, not in any way asking these experts what
8 their knowledge is of using one social discount rate
9 versus another or using some input/output model for
10 labour impacts as opposed to a cost/benefit analysis.
11 That would not be the type of thing I'm talking about.

12 MADAM CHAIR: Well, I guess the Board
13 can't understand why these witness would have anything
14 to say about socio-economic impacts.

15 If there's something specific you want to
16 ask about your clients' interests with respect to
17 hunting and that sort of use of the resource, then you
18 should go ahead and do that, but I don't think the
19 Board will put up with very much time spent on long
20 questions explaining to the witnesses about net present
21 value and then trying to get them to respond to it.

22 If there are some very precise questions
23 that you want to put to them, then that's is one thing
24 and we can cover that quickly.

25 MR. HANNA: I appreciate that, Madam

1 Chair. I would just like to reiterate to the Board - I
2 know I've said this before - but my clients' interest
3 goes much farther than hunting and my clients'
4 interests involve having responsible management of our
5 forests in all respects, and that involves how do you
6 set objectives -- meaningful objectives that will be
7 used to evaluate and ensure that responsible management
8 of the forest takes place.

9 These witnesses, this panel is going to
10 come forward and say to you, here are the way that we
11 should manage the forests, one referring to a landscape
12 management approach and the other referring to an
13 ecosystem approach, I'm not sure of all of the nuances
14 that each has involved in looking at until we hear the
15 evidence.

16 The point is that that is part, as I
17 understand it - unless I misunderstand FFT's approach -
18 part of an integrated approach that they see to
19 managing the forest. And the questions that I wish to
20 put to this witness panel is. How does your approach
21 integrate with all the other elements of the FFT case
22 and how does the specific management approach you're
23 coming forward with in terms of wildlife interface
24 with, for example, the socio-economic evidence that's
25 being led now in this panel, that's been led in Panel 4

1 and that's been led in Panel 5.

2 MADAM CHAIR: The Board thinks that's an
3 impossible question, Mr. Hanna. It's been our
4 experience in three years that each witness has chosen
5 to see one part of timber management planning from
6 their own perspective. We have not come across a
7 witness who can sum it all up for us and integrate all
8 of the evidence of everyone else who's come before them
9 and will follow.

10 Again, I think your organization
11 represents a very broad interest. I was using hunting
12 as an example of a socio-economic activity that you
13 might have some specific questions for. But again,
14 just listen, the Board won't spend a lot of time
15 listening to a witness be grilled for an area that
16 they're not expert in.

17 MR. HANNA: I appreciate that.

18 MR. LINDGREN: And, Madam Chair, I would
19 just pick up on one point that you made, and that is,
20 the integration of this package, the integration of all
21 the terms and conditions clearly is a matter for final
22 argument for the reasons that you just stated, no one
23 single witness can be expected to know how it all fits
24 together or should fit together and, for that reason, I
25 think it would most probably have to be wait until

1 final argument or negotiation sessions, certainly not
2 before that time.

3 And those are my only questions about the
4 statements of issue.

5 MADAM CHAIR: Do the parties have any
6 questions of Mr. Lindgren about this evidence?

7 MR. HANNA: I have none, Madam Chair.

8 MADAM CHAIR: None, Mr. Hanna.

9 Do we have any estimates of how long we
10 will be with these witnesses?

11 MR. LINDGREN: I would estimate that the
12 examination-in-chief will probably last one and a half
13 to two days. I expect we'll be at least a day and a
14 half, but certainly not more than two days.

15 MADAM CHAIR: Mr. Hanna?

16 MR. HANNA: At this time, Madam Chair, it
17 could be two to three days.

18 MADAM CHAIR: And, Mr. Hanna, just a
19 question: Do you expect that it would take you such a
20 long time to cross-examine because you disagree with
21 what these witnesses are saying?

22 MR. HANNA: Yes, Madam Chair.

23 MADAM CHAIR: Mr. Cassidy?

24 MR. CASSIDY: Less than a day, and I
25 would say probably closer to half a day.

1 MADAM CHAIR: Ms. Blastorah?

2 MS. BLASTORAH: It's a little difficult
3 to project as usual without having heard the other
4 parties cross, but I would project at this time one and
5 a half to two days.

6 MADAM CHAIR: Ms. Seaborn?

7 MS. SEABORN: Two hours, Madam Chair.

8 MADAM CHAIR: Thank you.

9 Have you sorted out, Mr. Lindgren and Ms.
10 Swenarchuk, whether 8 is following 9 or 10 is
11 following?

12 MR. LINDGREN: Yes.

13 MADAM CHAIR: Did you sort all that out?

14 MR. LINDGREN: Dr. Legator's evidence
15 will be following Panel 9 evidence.

16 MADAM CHAIR: Okay.

17 MR. LINDGREN: I'd like to speak to you
18 briefly, Madam Chair, if I could on the issue of the
19 start date for the Panel 9 evidence.

20 It would appear that the Panel 7 evidence
21 will conclude at some point next week, perhaps by
22 mid-week, maybe even late Tuesday afternoon, certainly
23 by Wednesday based on the estimated cross-examine
24 length that we've heard.

25 We were tentatively scheduling the panel,

1 the wildlife panel, to begin the week of February 18th
2 which is the following week and we did that for two
3 reasons.

4 One, two of the three witnesses are
5 professors and that is their reading week and they
6 obviously have commitments before that time and after
7 that time and that would be the best time for them to
8 appear.

9 The third witness who is Dr. Jim Bendell
10 has been out of the country for a number of months now
11 doing field research and it's my understanding that he
12 was to be back this week. I just phoned his office and
13 he's not back.

14 So I'm not sure if we're going to be in a
15 position to actually start next Wednesday or Thursday,
16 but certainly by the following week, which again is
17 Monday the 18th, that would be our preference.

18 I will undertake to continue to contact
19 Dr. Bendell, but I'm not at this point sure whether
20 he'll be in town and ready to proceed on next
21 Wednesday.

22 MADAM CHAIR: All right. The Board might
23 have a problem -- I might have a problem sitting next
24 Monday and I'm just waiting to get some confirmation of
25 that, in which case it would be a short week next week,

1 Tuesday, Wednesday and Thursday.

2 MR. LINDGREN: Possibly Thursday.

3 MADAM CHAIR: Do you think we could
4 finish the evidence of Panel 7 in three days?

5 MS. SWENARCHUK: It appears that we
6 certainly will, Madam Chair.

7 MADAM CHAIR: All right. Then I'll
8 notify you now that Monday might be a problem and I
9 hope to be able to tell you for sure tomorrow.

10 Do the parties have any objections if we
11 don't start Panel 9 until the 18th.

12 (no response)

13 No.

14 MR. LINDGREN: One other matter that
15 perhaps we can address right now, and that is the
16 statements of issue deadline for Dr. Legator's
17 evidence.

18 I spoke with Mr. Castrilli at noon and he
19 advises that the interrogatories on that evidence will
20 likely go out by the end of this week or certainly by
21 the beginning of next week, so we're suggesting that
22 possibly a statements of issue deadline be set for late
23 next week with a scoping session to follow at some
24 point during the following week, and we have no
25 preferences in terms of dates, but that's the general

1 scheduling that we would then suggest.

2 MADAM CHAIR: Do parties have any
3 suggestions? Mr. Hanna, does anyone have a suggestion
4 about when you'd like the deadline for the statements
5 of issues to be next week?.

6 MR. HANNA: Madam Chair, we will not be
7 cross-examining that panel, we will not be submitting
8 statements of issue.

9 MADAM CHAIR: All right, thank you.

10 Why don't we set a deadline for next
11 Thursday and we could have the scoping session on --

12 MS. SEABORN: The 18th perhaps, Madam
13 Chair.

14 MADAM CHAIR: Mr. Martel finds it kind of
15 difficult on Mondays. He's been up since early this
16 morning flying to Toronto. I think we'll do it on
17 Tuesday the 19th.

18 MR. CASSIDY: There is only one minor
19 matter, Madam Chair, and I hope it doesn't become a
20 problem. I will do everything in my power to discuss
21 with other counsel to avoid that, but I may have a
22 problem if I'm cross-examining the week of February the
23 25th, but I will try and work that out.

24 It would probably be a situation where I
25 might ask indulgence of counsel to let me go ahead on

1 the understanding they come back and do something if
2 there was something raised in my cross-examination. I
3 will gauge that and we will try and work around it.

4 MADAM CHAIR: Mr. Cassidy, as you know,
5 the Board let's the parties sort these things out by
6 yourselves.

7 MR. CASSIDY: I just wanted to advise
8 you, Madam Chair.

9 MADAM CHAIR: Is that everything then?
10 Mrs. Blastorah?

11 MS. BLASTORAH: One question, Mrs. Koven.
12 Is the Board aware of any other parties that will
13 cross-examining the Panel 9 witnesses other than
14 parties who are here, it would affect the schedule.

15 MADAM CHAIR: Not yet.

16 MR. LINDGREN: We've only received
17 statements of issue from the four parties, Madam Chair,
18 so I would suggest that that would be it.

19 MADAM CHAIR: Why, was there another
20 party you I thought might --

21 MS. BLASTORAH: No, I just thought I
22 would ask, Mrs. Koven.

23 MADAM CHAIR: Okay, thank you.

24 We'll see you at nine tomorrow morning.

25

1
2 ---Whereupon the hearing was adjourned at 4:35 p.m., to
3 be reconvened on Tuesday, February 5th, 1991,
4 commencing at 9:00 a.m.
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25 [c. copyright, 1985.]

